

THE CORNELL COUNTRYMAN



HORTICULTURAL ISSUE

PACKING APPLES IN BOXES

By R. W. REES

FRUIT FOR HOME GROUNDS

By W. H. CHANDLER

VEGETABLE CASH CROPS

By PAUL WORK

COOPERATIVE MARKETING

By J. T. OWENS

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Fig. 1500



Fig.
180

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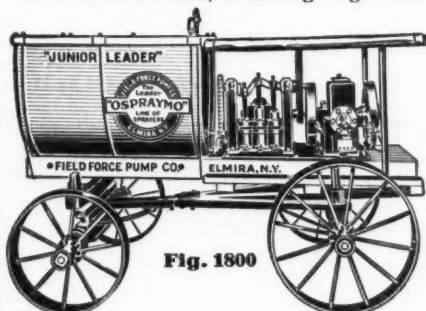


Fig. 1800


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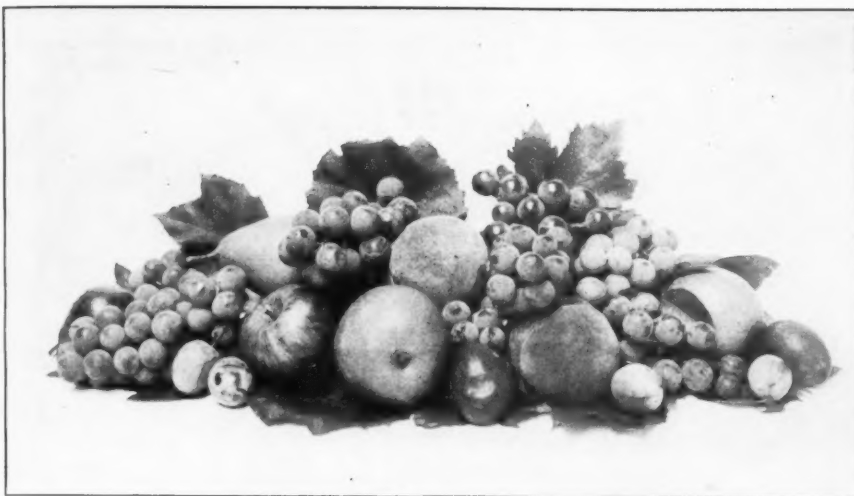


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A Song of Home

*No tale to tell, no song to sing have I—
From foreign night my homing fancies fly.*



—The little hills that fold the fertile farms,
The low stone homesteads sheltered in their groves,
The growing crops, the cattle browsing on
The green, onrolling faces of the fields;
And friendly roads which wend their pleasant ways
About the valleys and the gradual hills
And lead through colonnades of leaning green
To other hills and other peaceful vales—

Tonight the moon is very near; the stars
Are distant in the softly shrouded sky.
The hills are gathered in the arms of dark,
And, from the dark, night-breezes move and smooth
The soothing mantle of a summer night
Upon the placid faces of the fields.
On silent porches all my people sit
And of the peaceful night all are a part.

Next day they rise and go their toilsome ways
Around their fields, along their dusty roads,
And when they meet each other on the way
They stop to speak, to pass the time of day
And simply speak a while of simple things,
Then go their ways; their simple ways, and do
Their unsung deeds; and when their work is done
They fall asleep and do not fear to wake.



*No tale to tell, no song to sing have I—
But I know how I want to live—and die!*

A. P. N., '18.

THE CORNELL COUNTRYMAN

Vol. XIV

ITHACA, N. Y., FEBRUARY, 1917

No. 5

Cooperative Marketing

The Speech that Won the Rochester Speaking Contest

BY JAMES OWENS, '17

LAST fall a farmer whom I know had one hundred barrels of parsnips for sale so he drove into the nearest city to see what he could get for them. After shopping around for half a day he finally came upon one commission merchant who would buy them. This commission merchant was willing to pay seventy-five cents a barrel for the parsnips provided they were carefully washed, put in open head barrels and hauled into the city. The deal was made. As the farmer was walking along the street to the livery stable to get his team he passed a grocery store and seeing some parsnips in the window thought he would find out how much they were worth. The price of the parsnips was 25 cents a peck. Now, there are twelve pecks in a barrel and this meant that the consumers were paying three dollars for the same barrel of parsnips for which the farmer received 75 cents. In other words the farmer, who had furnished the seed, the land, the labor in growing the crop and had delivered it to the city was getting, in this particular case, just twenty-five cents of the consumer's dollar. This is not a single outstanding incident, but unfortunately the general course of affairs. The farmer works hard to produce a crop. He furnishes the land, the labor, the seed, takes all the risks and his share for all these labors is twenty-five cents of the dollar which the poor consumer has to pay.

Is it any wonder that Professor Warren of the department of Farm Management of Cornell University said before the Wick's committee last year, that annually one-third of the farmers of this state do not clear expenses. Another third just make the books balance, while the other third make an annual labor income of three hundred dollars. What else could one expect under a system where it is generally admitted that the farmer's share of the consumer's dollar is only thirty-five cents?

It is a wonder that we do not all come under that first division of farmers. Don't you think that we more fortunate ones who come in the latter class make up by greater toil and perseverance, what justly belongs to us but which we do not get for our labors in producing the crops that feed the nation?

What is the matter with the present system of marketing? Should it cost from 65 to 75 cents to market a product when the farmer has to produce it and take it to the market for from 25 to 35 cents? Some people say that the middlemen are to blame, that they are the ones who get the farmer's profit. It seems though that it should be said in fairness, that the frequent criticism of the middlemen does not belong to all of them. However, they are not in the business for the pleasure of handling our products and necessarily in their own interests, have to take all they can for handling these products. It is the

system though that makes them necessary and the avarice or dishonesty of some of them that gives rise to the criticism of all of them.

Let us look into the history of the citrus industry of California. Twenty years ago the citrus industry of California was unorganized, demoralized and unprofitable to the growers. But the railroads and commission merchants were making money from it; for high freight rates, high commission charges, reported damage in transit, and dishonesty on the part of the agent who handled the fruit were matters of every day occurrence.

These growers were in a rather bad way because they were handling a very perishable product that had to be shipped to and sold in markets that were two or three thousand miles from their farms. They were not in a position to know whether their product had spoiled in transit or really arrived at the market all right. The commission agents looked the fruit over when it arrived and often times carloads that arrived in good condition were reported as having spoiled in transit. In this case the grower lost and the commission man was the gainer.

Why, conditions became so bad out in California that the growers were actually pulling up their lemon and orange trees. As they looked at it, that was the only thing to do because it was pretty discouraging to get a bill for services from the railroads and commission merchants instead of a check for the crop that had been sent to market.

Some of the farmers though who had paid good hard money for their farms hated to see it melt before their eyes by pulling up the trees for which they had paid so dearly. They decided to try coöperation, for they realized that as individuals they were not able to cope with the railroads and commission men. Their first step was to establish their own packing houses where their products could be graded, inspected and standardized by experts of their own choosing. Then they established their

own selling organization. Men of their own choice depending upon their loyalty to the growers for their jobs and drawing salaries for their undivided attention to the growers' interests, were sent to the big fruit markets to sell the fruit. A large part of the duties of these men was to study market conditions in their territories and to keep the central office at Los Angeles so informed that the officers of the association could ship the fruit to those parts of the country where the supply was low and the price high, and divert shipments from markets that were already glutted.

What have been the results of this organization? In the first place the cost of packing has been reduced from fifty to thirty cents a box. In the second place the cost of selling has been reduced from around ten per cent to three per cent, for infinitely better service. In the third place the exchange causes around \$30,000,000 to come annually into the pockets of the orange and lemon growers, whereas in former times the profit was often of a minus character. This is the result of organization and business methods applied to farming. Any other group of farmers can achieve the same freedom and profit by like methods.

Transition

Under the present method of carrying on business the unit is the car-load. What is the farmer going to do who hasn't a full carload of each variety? There are three things he can do; first he can ship these barrels of apples to a commission merchant and pay a freight rate so high that it cuts down nearly all of his profits, second he can sell these few barrels to a local buyer and receive thirty-five cents of the consumer's dollar, or in the third place he can go in with a couple of his neighbors who are in the same boat that he is, and get enough fruit for a carload of a single standard variety. Thus the freight per barrel is reduced and it is possible for the product to be put upon the market without the costly help of all the mem-

bers of the marketing system. The result is that the profits that used to go to these intermediate steps go instead to the producer and help to give him a greater share than thirty-five cents of the consumer's dollar.

An example of this type of coöperation is illustrated by the Monmouth Co. Farmer's Exchange of New Jersey. This exchange was established about ten years ago by some farmer Grangers who were not satisfied with the profits they were making from their toil. In the words of a Pennsylvania State Professor "As they figured it out they were getting just 41 cents on every dollar the consumer paid for potatoes. The other 59 cents went to feed and pay the captains and privates in the great army of middlemen that stretched away from the farmer's front gate to the consumer's back door." The expensive system of reaching the consumer was as follows: The farmer delivered his potatoes to the local buyer for say \$1.60 per barrel. This local buyer sold them to a jobber in New York at about 10 cents a barrel in advance. This jobber sold them to a second jobber in Chicago, Cincinnati or some other city at an advance of from 10 to 15 cents a barrel. The commission merchant next sold them to the retail grocer at another small advance, and the retail grocer tacked on another 25 to 50 per cent advance before he sold them to the consumers. When to this was added the freight of perhaps 50 cents a barrel, the consumer actually paid over \$3.50 for the same barrel for which the farmer received \$1.60. Five sets of dealers handled them and everyone who touched them increased their cost to the consumer without any benefit to the farmer. The farmer had the 41 cents and the consumer paid his dollar and the system had the other 59 cents.

What did the potato growers do? Did they bewail the fact that things weren't like they used to be and that now everyone had to be paid if he did anything for you? No, on the contrary they decided to remove a few of these

connecting links instead and pocket the profits they used to take up. They began by collective shipping on stated days in the week, and holding the potatoes in storage houses in the city if prices were not high enough when the cars reached the market. Storage rent was a little high so they conceived the idea of building storage houses at the country stations where labor was cheap and rent low. If the price in the fall was not high enough they put their potatoes into storage and waited until more favorable conditions came around. Under the old system Monmouth county potatoes were first dumped into New York City, no matter whether they were later reshipped and the farmer got New York prices whether they were higher or lower than those of other cities.

Now the exchange deals directly with commission merchants in the smaller cities and thus avoids the profits to the jobbers in New York and in the city where the product is sold, round about freight rates and glutted markets. In short the exchange succeeds in reducing the expense of the journey from the farmer's front gate to the consumer's back door by about 50 to 60 cents a barrel. In other words the exchange has brought to the farmers in the form of profits a goodly share of the 59 cents that used to go to feed and pay the captains and privates in the great army of middlemen. Now, didn't it pay those farmers to coöperate?

Couldn't a system something along that line be made to work out just as well in New York as in New Jersey? Couldn't we get together and at first send in directly to the markets our produce in car lots. Later when we have learned to coöperate and have become organized shouldn't there be a storage plant in each town at the railroad station, where we could all bring our fruit and keep it until our agents saw an opportunity to advantageously sell it on the market? Wouldn't this help to solve the problem and to give to us farmers as our most deserved right, a greater share of the consumer's dollar?



Packing Apples in Boxes

BY R. W. REES

Professor of Pomology at Cornell University

THE box pack for apples has been largely developed in the Pacific Northwest, and in fact is the only type of pack known in that district. For several years it has been tried to a greater or less degree by certain eastern growers, but on the whole has never attained any considerable commercial importance.

The barrel is our standard package. Our barrel product is established on the market and buyers expect to find our fruit in this package. Under New York State conditions the box is more expensive, not only for the package, but also in cost of packing. It is hard to secure competent packers who have had sufficient experience to reduce the cost of box packing to a point where it is commercially profitable.

There are a few growers of fancy apples in New York and New England who are successfully using the standard box as a market package. They have developed special markets, such as high class retail fruit stores, hotels, and dining car trade, that take their fruit at good prices. In many instances they are receiving a substantial margin of net profits above neighbors who pack their fruit in barrels. There is undoubtedly room for some other growers to develop good markets for fancy fruit properly packed in boxes.

To be successful with box fruit it is very important that the grower be able to produce a crop of fruit, a large percentage of which will satisfy the New York Standard for Fancy Grade. The grower must also be in a position to

reach a special market, rather than depending on the general trade.

Boxes

In earlier years two types of boxes were used in the Pacific Northwest, one, the standard, which is $10\frac{1}{2} \times 11\frac{1}{2} \times 18$ inches (inside measurements), and another, the special, which is $10 \times 11 \times 20$ inches (inside measurements), and was used to pack certain sizes of fruit which did not seem to pack well in the standard box. However, with the development of better methods of packing, it was found that all sizes could be easily packed in the standard box, therefore, the special is declining very rapidly in favor. We would advise the use of only the standard box in New York State.

The ends of the box should be one-piece material $\frac{3}{4}$ of an inch thick, sides $\frac{3}{8}$ of an inch thick, and the tops and bottoms two-piece $\frac{1}{4}$ of an inch in thickness. Cleats for tops and bottoms should be $\frac{3}{8} \times \frac{3}{4} \times 11\frac{1}{2}$ inches. The boxes should be nailed with five penny, cement coated nails, using four nails in each end of top, side and bottom.

Accessories

Lining Paper—Nearly all supply stores that deal in packing equipment carry lining paper. This paper will be found in several weights and grades. For ordinary use white news stock is satisfactory. It should be cut $17\frac{1}{2} \times 26$, although $17\frac{1}{2} \times 24$ size may be used.

Layer Board—Manila tag board medium weight $17\frac{1}{2} \times 11$ is usually used for this purpose. A layer board is placed in the bottom of the box after

lining, and one is placed on top of the pack before the lining paper is folded over the fruit. In some packs, which will be discussed later, layer boards are used between layers of apples.

Wrapping Paper—Many grades of wrapping paper are handled by various supply houses. These grades will vary from a medium tissue to heavy white

having a table of convenient size and form can not be over emphasized in box packing. The table should be four feet square or three feet in width, and from four to five feet in length. A rough home-made table which answers the purpose well is shown in figure 1.

Grading and Sorting

The fruit should be graded for qual-



Figure 1
A Home-Made Packing Table

news. If the lighter weight papers are used, it is important that they be very tough to prevent splitting. By all means, however, avoid heavy brash types of papers inasmuch as they are hard to use and often give a very unattractive appearance when the pack is finished. The size of paper will vary from 8 x 8 to 12 x 12 inches, depending on the size of the fruit to be packed. For Baldwin, Spitzenburg, and McIntosh 9 x 9 and 10 x 10 will be used more than other sizes.

Paper Holder—The paper holder may be made of wood or light weight galvanized iron. It is simply a paper holder which is hooked over the side of the box to keep the paper in a convenient position for use of the packer.

Packing Table—The importance of

ity, color and size before it comes to the packing table. Inasmuch as all boxed fruit will, in a general way, come in competition with fruit which has been carefully graded for both size and quality, we would suggest that only fruit which will meet the New York Standard for Fancy grade be marketed in this package. If we keep this ever in mind we will have quality which will meet the competition and result in repeat orders. If, on the other hand, we put up a pack of lower quality the type of package will only help to discriminate against its sale. The importance of careful sizing can not be over estimated. It is the first essential in making a uniform pack, neat in appearance, and of good shipping quality. The sizing may either be done

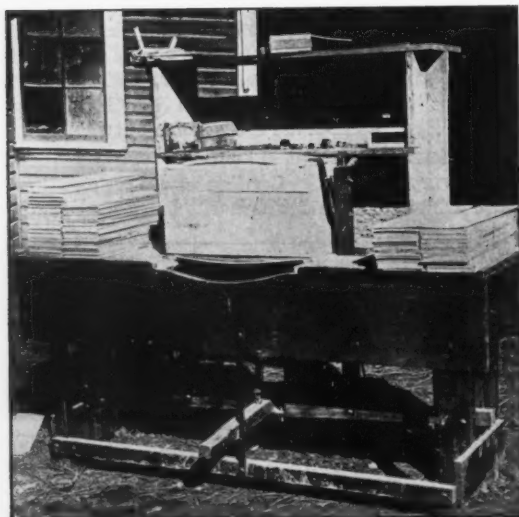


Figure 2
A Simple but Complete
Home-Made Box
Press

Box Press—Where any considerable amount of packing is done, it is very important to have a special box press. With the box press we are able to bring the pressure on the ends of the cover, allowing it to bend and evenly distribute the pressure over the entire contents of the package.

by hand or by one of the several sizing machines which are now to be found on the market.

Packing

Place the box in position on the rack at the side of the table; line with paper, and place a layer card in the bottom of the box. Adjust the paper holder on the side of the box as shown in figure 1 and you are ready to begin the actual work of packing.

If the fruit on the table is less than three inches in diameter you will use the 3 x 2 style of pack. This pack is started by placing the first apple in the lower right hand corner of the box, the second in the lower left hand corner, and the third in the center of the space between one and two. The fourth apple is placed in the space between one and three, and the fifth in the space between two and three. The method of starting the 3 x 2 pack is shown in figure 3. The second layer is started by placing an apple over the space left between one and three or the first layer, and a second apple over the space between two and three. The third and fifth layers are packed exactly as the first, and the fourth is packed as the second.

In the West, where the apples are

somewhat more elongated and angular, they are usually packed on the cheek. With our elongated varieties, as Spitzenburg and Delicious we would use the cheek pack, but for varieties like McIntosh and Baldwin, if packed in the 3 x 2 style, it will be found easier to get the proper height if the fruit is packed on end. Pack the first layer blossom end down and the remaining layers blossom end up. This will prevent stem punctures as the stems will be pointing into the spaces between the fruits. Eight kinds of 3 x 2 packs are in use. These vary from four to eight apples to the

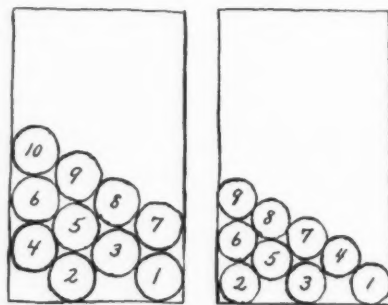


Figure 3
Start of a 2 x 2 pack Start of a 3 x 2 pack

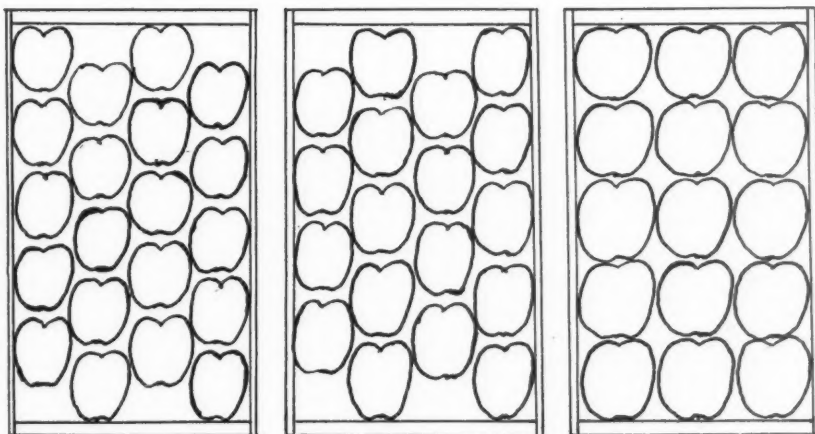


Figure 4

Showing two styles of a 2 x 2 pack and a Straight 3 pack

row, and are determined by the size of the fruit which is being packed.

Apples from three to three and three-fourths inches in diameter will be packed in the 2x2 style shown in figure 4. This pack is started as shown in figure 3. The second layer is started by placing an apple over the space in the lower left hand corner of the box and the second over the space between apples one and two of the first layer.

In the 2 x 2 styles most varieties pack

best on the cheek, but with flat sorts, the sizes which pack 80 to 56 apples to the box, will work best on end.

Very large apples, 3 $\frac{3}{4}$ inches in diameter, are sometimes packed "straight" as shown in figure 4. This is to be avoided, however, when possible as it brings the cheeks of the apples of one layer directly against those of the one below, causing greater bruising when the box goes on the press.

(Continued on page 400)

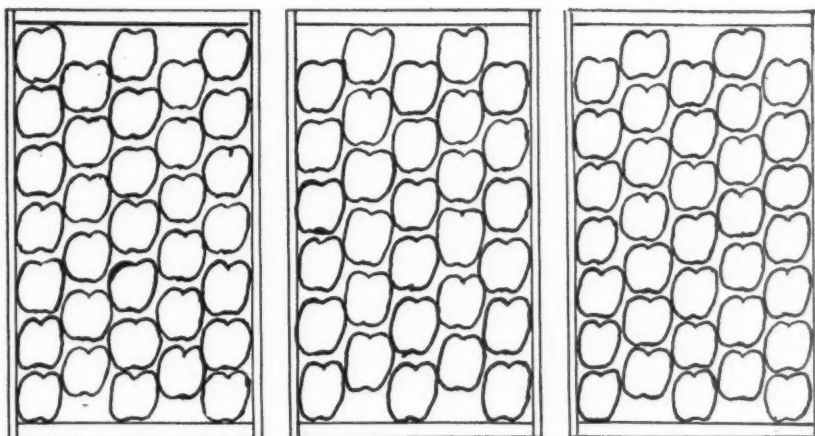


Figure 5

Showing some styles of the 3 x 2 pack



FARM BUREAU WORKERS OF NEW YORK STATE

Washington at Work

A series of articles furnished exclusively to the Association of Agricultural College Magazines. Bureau Chiefs of the United States Department of Agriculture describe from the inside their work for the farmer.

V. THE WORK OF THE WEATHER MEN

BY C. V. MARVIN

Chief, United States Weather Bureau

THE history of the Weather Bureau as an organization begins with the passage of the Act of Congress, approved February 9, 1870, which authorized and required the Secretary of War to provide for the taking of meteorological observations throughout the United States and for giving telegraphic notice on the lakes and seacoast of the approach of storms. Since its establishment the scope of its work has been gradually extended until now its functions as defined by law embrace the forecasting of the weather; the issue of storm warnings; the display of weather, frost and flood signals for the benefit of agriculture, commerce and navigation; the gaging and reporting of rivers; the maintenance and operation of seacoast telegraph lines and the

collection and transmission of marine intelligence for the benefit of commerce and navigation; the reporting of temperature and rainfall conditions for the cotton interests; the display of frost, cold-wave and other signals; the distribution of meteorological information in the interests of agriculture and commerce, and the taking of such meteorological observations as may be necessary to establish and record the climatic conditions of the United States, or are essential for the proper execution of the foregoing duties. From the date of its organization until July 1, 1891, the weather service was conducted as a branch of the Signal corps, under the direction of the Chief Signal Officer of the Army, but on the date mentioned it was transferred to the De-



The Weather Man Making Use of a Kite

partment of Agriculture and made a Bureau of that Department, under its present designation.

The Weather Bureau is probably best known to the general public through the exercise of its principal and most important function, the issue of the daily weather forecasts. These forecasts are based upon simultaneous observations of local weather conditions taken daily at 8 a. m. and 8 p. m., 75th meridian time, at about 200 regular observing stations scattered throughout the United States and the West Indies and upon similar reports received daily from various points in other parts of the northern hemisphere. The results of the twice-daily observations are immediately telegraphed to the Central Office at Washington, D. C., where they are charted for study and interpretation by experts trained to forecast weather conditions which may be expected to prevail during the following thirty-six to forty-eight hours. From these data the fore-

caster, by comparison with preceding reports, is able to trace the paths of storm areas from the time of their appearance to the moment of observation, and approximately determine and forecast their subsequent courses and the resultant weather conditions.

Forecast centers have also been established at Chicago, Ill.; New Orleans, La.; Denver, Colo.; San Francisco, Cal., and Portland, Ore. Within two hours after the morning observations have been taken the forecasts are telegraphed from the forecast centers to about 1,700 principal distributing points, whence they are further disseminated by telegraph, telephone and mail. The forecasts reach nearly 100,000 addresses daily by mail, the greater part being delivered early in the day, and none later, as a rule, than 6 p. m. of the day of issue, and are available to more than 5,000,000 telephone subscribers within an hour of the time of issue. This system of forecast distribution is wholly under the supervision and mainly at the expense of the Government, and is in addition to and distinct from the distribution effected through the press associations and the daily newspapers. The rural free mail delivery system and rural telephone lines are also being utilized to bring within the benefits of this system a large number of farming communities. A careful comparison of the forecasts with the weather conditions occurring over the regions and during the periods covered shows that approximately ninety per cent of the forecasts are verified.

The daily weather maps, based on the data contained in the morning telegraphic reports, are issued as soon as practicable after these reports are received. On these maps the salient features of the current weather conditions throughout the country are graphically represented, accompanied by a synopsis of these conditions; in addition to which complete reports from all the observing stations are presented in tabulated form. In order that all sections of the country may receive



Sampling Snow for Measuring
Water Content

weather data, maps or bulletins containing the data in tabulated form are issued from about one hundred of the larger stations.

The ocean meteorological service

various forecasts, observations at many intermediate points are necessary before the climatology of the United States can be properly studied. This need has given rise to the establish-



**Weather Bureau of the United States Department of Agriculture
at Washington, D. C.**

aims to collect, through the coöperation of vessel masters and others, meteorological observations at sea. The recent development in the art of radiotelegraphy has made possible the transmission of meteorological service. The Weather Bureau has organized a system of meteorological observations on vessels navigating the coastal waters of the Middle and South Atlantic States, the Gulf of Mexico, and the Caribbean Sea, the primary object being to gain information of subtropical storms which occasionally traverse the waters above named. Distribution of weather information, forecasts, and warnings, is made daily by radio service through the coöperation of the radio service of the United States Navy.

Although the 200 regular observing stations, each representing about 16,000 square miles of territory, furnish sufficient data upon which to base the

ment of an important and interesting feature of the Weather Bureau in its Climatological Service. This service is divided into 44 local sections, each, as a rule, covering a single state, and having for its center a regular observing station. These centers collect temperature and rainfall observations from more than 4,000 coöperative stations and publish these data in the form of monthly reports which are given a wide-spread distribution. During the growing season (from April to September, inclusive) each section also receives mail reports from numerous correspondents, aggregating for all sections about 7,500, concerning the effects of the weather upon crops and farming operations, these reports being used to compile data for weekly bulletins. During the same season the Central Office at Washington issues a National Weather and Crop Bulletin containing a series

of charts graphically illustrating current and normal conditions of temperature and rainfall for the entire country, a general summary of the weather, and brief reports on the condition of the crops for each state. Throughout the cotton, corn, wheat, sugar and rice producing sections designated centers receive telegraphic reports of rainfall and daily extremes of temperature from nearby points for publication in bulletin form, each local center receiving condensed reports from all others.

With the assistance of several thousand coöperative observers, many of whom have maintained local records for long periods, the Weather Bureau endeavors to collect special local data and thus perfect the records that are needed for the study of the relation between climate and agriculture, forestry, water resources, and other kindred subjects. The results of these observations appear in detail in monthly and annual reports published at the respective section centers.

A Division of the Bureau known as The Division of Agricultural Meteorology has for its lines of work the application of meteorology to the needs and interests of agriculture; conducting studies of meteorological and climatic conditions in their relation to agriculture and the growth and yield of crops; conducting investigations of the effect of weather and climate upon plant growth; determination of the distribution of frost warnings and forecasts to special agricultural interests; conducting studies for the protection of crops and orchards from frosts, and distributing information as to the effect of the weather and climate on crops, through the medium of the National Weather and Crop Bulletin and other publications.

Among the publications of the Weather Bureau, the following are worthy of special notice:

The Monthly Weather Review, which has been published regularly since January, 1873, and which contains elaborate meteorological tables and charts

showing the weather conditions for the month over the United States and neighboring countries.

The reports of the Sections of the Climate and Crop Service, showing in detail the climatic conditions of the month.

The Weekly Weather and Crop Bulletin, which gives in detail the weather conditions that have prevailed throughout the country during the week and its effect upon the crops.

The occasional bulletins, now numbering about seventy, containing the larger reports made by the experts of the service.

The Annual Report of the Chief of Bureau presents a full summary of climatic data for the United States.

The library of the Weather Bureau contains about 32,000 books and pamphlets, consisting principally of technical books on meteorology and allied sciences, and of published climatological data from all parts of the world. It is available to all Weather Bureau officials and to students of meteorology generally, who either consult it personally or through correspondence. In addition to its general card catalogue, it keeps up to date a catalogue of the meteorological contents of the principal scientific serials of the world.

The apparatus used at Weather Bureau stations for recording weather conditions is largely the result of improvements devised by the Instrument Division, to which is intrusted the care of all standards. The kites, meteorographs, self-registering instruments, and other forms of apparatus devised by the Weather Bureau are favorably known throughout the world.

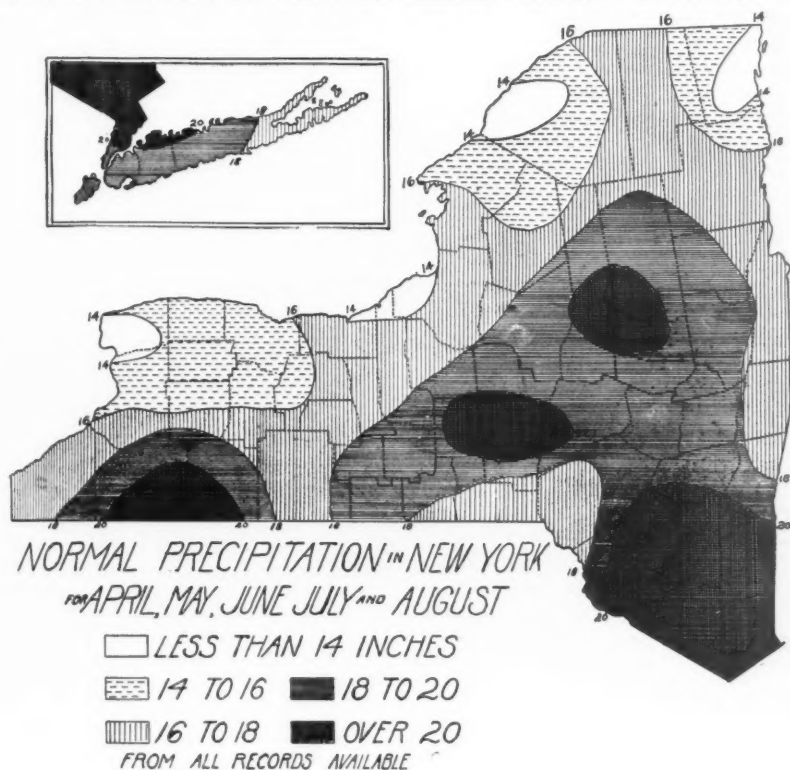
The Bureau has a force of scientists and trained employees engaged in research work in connection with upper air conditions and solar radiation and investigations in seismology.

The extent to which the work of the Weather Bureau, in the collection and publication of data and the issue of weather forecasts and warnings, affects the daily life of the people and becomes

a factor in their various avocations and business enterprises, already very great, is increasing yearly.

The uses made of the daily forecasts are so numerous and well known as to call for no remark, but the value to the

and the shores of the Great Lakes, including every port and harbor of any considerable importance; and so nearly perfect has this service become that scarcely a storm of marked danger to maritime interests has occurred for



What the Weather Man Says About Us

manifold business interests of the country of the publication of weather data and the dissemination of warnings of exceptionally severe and injurious weather conditions, such as storms and hurricanes, cold waves, frosts, floods, heavy rains and snows, is not so generally understood. Of the warnings mentioned, those of storms and hurricanes, issued for the benefit of marine interests, are the most important and pecuniarily valuable. Storm warnings are displayed at nearly 300 points along the Atlantic, Pacific and Gulf coasts

years for which ample warnings have not been issued from twelve to twenty-four hours in advance. The sailings of the immense number of vessels engaged in our ocean and lake traffic are largely determined by these warnings, and those displayed for a single hurricane are known to have detained in port on our Atlantic coast vessels valued, with their cargoes, at over \$30,000,000.

The warnings of those sudden and destructive temperature changes known as cold waves are probably next in importance. These warnings, which are

issued from twenty-four to thirty-six hours in advance, are disseminated throughout the threatened regions by means of flags displayed on regular Weather Bureau and subdisplay stations, by telegraph, telephone, and mail service to all places receiving daily forecasts, and to a large number of special addresses in addition. The beneficial results of these warnings are manifold. Precautions are taken for the safeguarding of personal comfort and health, and the protection from freezing of produce of all kinds, steam and water pipes, hot house plants, and flowers. Railroads regulate the size and movement of their freight trains, ice men prepare for harvesting, and many plans for business and pleasure are made on the expectation of the conditions forecast. The warnings issued in January, 1896, for a single cold wave of exceptional severity and extent, resulted, according to reports, in the saving of over \$3,500,000 in the protection of property from injury or destruction.

The warnings of frost and freezing weather are also of immense value, particularly to the fruit, sugar, tobacco, cranberry and market gardening interests. The early truck raising industry, so extensively carried on in the regions bordering on the Gulf and South Atlantic coasts, and in Florida, and which has increased so greatly in the last few years, is largely dependent for its success on the coöperation of the Weather Bureau in this particular, and the growers of citrus and other fruits liable to injury by frosts or freezing weather have invested large sums in tents, screens, heating, smudging, and irrigating apparatus for the protection of their groves and orchards, which they put into use when notified by the Bureau of the expected occurrence of injuriously low temperatures.

The commerce of our rivers is greatly aided and lives and property in regions subject to overflow are protected by the publication of the river stages and the issue of river and flood forecasts

based on reports received from about 500 special river and rainfall stations. On the occasion of the flood of 1897 in the lower Mississippi Valley live stock and other movable property to the estimated value of about \$15,000,000 was removed from the inundated regions prior to the flood, as a result of the warnings by the Bureau a week in advance of its occurrence.

In the raisin-growing districts of California rain forecasts are of great value. The raisin crop while growing is extremely susceptible to injury from rain, and the warnings enable the producers to protect the fruit by stacking and covering the trays. The accuracy of the rain forecasts for this region and the system for their distribution have been such that practically no loss from this cause has occurred for years.

Shippers of perishable produce and goods liable to injury by heat or cold are guided largely by the weather reports in making shipments and in directing their movements while on the road. Large dealers in produce, by careful attention to the daily reports and the weekly crop bulletins, inform themselves as to the regions where conditions most favorable for certain crops have occurred, and are thus enabled to judge of the probable supply. Constructors of waterworks, bridges, culverts, and sewers consult the rainfall records to ascertain the maximum water flow they will have to allow for. Architects of iron and steel structures and tall buildings study the records of maximum and minimum temperatures and wind velocity, in order to estimate the contraction and expansion and amount of wind pressure their buildings must be prepared to withstand.

From the information as to climatic conditions made known through the reports, invalids and tourists are enabled to select the locations best suited to their health and pleasure, and manufacturers and agriculturists the regions best adapted for the carrying on of their particular industries. By the re-

(Continued on page 404)

Fruit for Home Grounds

BY W. H. CHANDLER

Professor of Pomology at Cornell University

IN SELECTING varieties for a home planting, there is too great a tendency to select those varieties that have proved most useful for the general market. Thus many of the very finest varieties have been lost or at least it is very difficult to secure trees because of the fact that they are not suitable for commercial purposes. It is the purpose of this article to suggest some of the varieties that have peculiar fitness for the home planting and to suggest cultural methods, particularly where it is desired to grow the trees in sod.

Apples

The apple is of course most desirable for the home planting since fruit is available through a long period of the year. Among the varieties ripening in the summer that might well be recommended for a home planting are Yellow Transparent, one of the earliest and finest for cooking though rather susceptible to blight; "Red" Astrachan, an apple of high quality, very early, but susceptible to blight. One of the very finest summer apples for the home planting is the Early Joe, a variety which is being lost because it is not suitable for commercial planting. Chenango (Chenango Strawberry), is a pinkish-red apple of fine flavor; the tree being very productive and bearing young. Fanny is an exceedingly fine apple, the tree of which is very vigorous.

Of the fall and winter apples where the planting is small, particularly in a city lot, the McIntosh is the best variety that can be grown. The tree is beautiful, both in form and foliage, and is very resistant to cold; the fruit being of the best quality. Many would use the Rhode Island Greening in the home planting because of the vigor of the tree, the excellent cooking quality of the fruit and the fact that the fruit may

be used from the tree gradually through perhaps a period of one month. There are so many fine varieties that no effort is made here to suggest a large number. Most people would want Baldwin for late keeping. If a light gravelly or sandy soil be available, one would want Northern Spy. Some would want Wealthy, both for its good quality and for the very early and uniform bearing of the tree, and because it is an excellent cooking apple. Some of the fine old varieties that are now difficult to secure are Rambo, Mother, and Melon. Each of these is excellent for a home planting, and the very best in quality. In a city lot in many cases, one would prefer to grow Dwarf Apples because of the satisfaction of having more varieties on a small planting. It is also convenient to spray them since they would not be tall. One would not expect more fruit from a number of dwarf trees than from the smaller number of standard trees that might occupy the same space; but one could have more different varieties and there would be more satisfaction in working with small trees.

Pears

Among pears, if but one variety is to be used, the Seckel would generally be most suitable. The tree is rather more resistant to blight than most other good varieties, and is more beautiful in form. The fruit is of the very best quality. The Bartlett is so well known that I do not need to mention it. Perhaps the Bosc has not received the notice it deserves. It seems to be fully as good a tree as the Bartlett. While the young tree is irregular or somewhat lumpy in form, it becomes a reasonably beautiful tree when it is mature. The fruit is certainly the equal of anything to be had in the orchard. In flavor it is of the very best, and in form and color, by

far the most beautiful. Of late varieties, the Winter Nelis is best in quality though the tree is a weak grower. Another late variety—the Lawrence—is a much better tree and the fruit is of good quality, but not as good as Winter Nelis.

Plums

Among home varieties of plums, the writer would place the Reine Claude first for the home planting. Jefferson is a larger plum of this same type. The German Prune is very productive and of reasonably high quality, though the French Prune, or Agen, is better in quality. Professor Hedrick of the New York Agricultural Experiment Station at Geneva, considers Imperial Epineuse to be one of the very best prunes in flavor. Because it is very desirable for cooking, and because the tree is very dependable in bearing, the Shropshire Damson or the French Damson may be desired, though either is useless for eating from the hand.

Cherries

If the climate is not too severe, and the soil is a rather light, sandy or gravelly one and well drained, the Sweet Cherry is one of the best fruits to grow,

particularly where it must be grown on the lawn, since the tree is very beautiful in form. Among the Sweet Cherries, the Yellow Spanish and Windsor are perhaps the most beautiful trees. The Yellow Spanish is perhaps the best tree; the fruit is also of rather higher quality than the Napoleon which it resembles, though it is more likely to be injured by Brown Rot. The Windsor is rather free from Brown Rot, and is one of the best firm, black, sweet cherries. Among other varieties that might be planted, is Black Tartarian which is a good tree and has fruit of the best quality; and Schmidt.

Of the Sour Cherries, of course Montmorency is the standard, but May Duke would generally be considered of better quality, and on account of both fruit and tree, it should generally be included in a home planting. Professor Hedrick recommends Reine Hortense for home planting because of the fine quality of the fruit, provided one does not consider it too acid, and because of the small trees that may be well adapted to growing where space is limited.

Care and Culture

It is not the intention here to give a



McIntosh Apple Tree during the sixth summer in the orchard. McIntosh bears reasonably young; it is extremely productive when the trees have reached full bearing and the fruit is of the very highest quality. It is peculiarly well adapted to the home planting, particularly the city lot, since it is beautiful both in tree form and in foliage. The tree is very hardy and may be grown in the coldest climates in which apple trees are grown

The Reine Claude plum tree is rather beautiful in form and one of the most desirable for planting on home-grounds. It grows rapidly and does reasonably well on sod. The fruit is of a rich golden color and very delicious.



complete system of care for a home planting, but to point out some features of the care that is peculiar to home planting. In the first place, it may be desired to grow the orchard in sod. It is well established that not so much fruit can be expected from an orchard in sod. With a home planting, this may not be a determining factor. It certainly would not be where the fruit is grown in the lawn. The means to offset the injurious effects of sod are two—the use of nitrogen, and rather severe pruning. In any but very fertile soil, fruit trees grown in sod should be heavily fertilized with some form of nitrogen, perhaps nitrate of soda. The cherry will show a very marked response to this treatment. Trees from one to four or five years old should have, perhaps, two pounds to the tree, spread in a radius of one and a half to three feet around the tree. Of course trees that are old enough to be in full bearing should have more, say three to five pounds to the tree.

Pruning will increase the vigor of the tree where a considerable amount of

wood is removed. Of course this increases the vigor at the expense of size, since the increased growth of the tree is not sufficient to compensate for what is removed in pruning. It requires a reasonably vigorous growth to secure uniform fruit, particularly with apples and pears. In the sod, pruning combined with the use of nitrogenous fertilizer will accomplish this. Pruning, however, should be cautiously done. The cutting should be always in the top of the tree, avoiding the cutting out of large branches or lopping back the tree. The twig should always be cut back to a strong secondary twig or branch, so that the wound will heal and so there will not be a tendency to push water sprouts.

Spraying can not be neglected in the home orchard if desirable fruit is expected, and one should not put out trees for the home unless he expects to spray them. A small spraying outfit adapted to his conditions can be secured.

Small Fruits

Among the small fruits, perhaps the grape is most important. The fruit is



A Young Bosc Pear Tree. It is very irregular in form while young but the old trees are rather beautiful in form. The Bosc is one of the very best of pears in quality though the tree is not so well adapted to the home planting as the Seckel.

extremely useful and healthful and much will be secured from a small planting. The following list of varieties will give fruit through a long season: Winchell, a white grape; Delaware, a red grape; Moore's Early, Worden, and Concord, black grapes. These are of course standard varieties with the exception of Winchell. One might want some of the varieties that have been produced by crossing with the European grapes. Among these, the Roger's hybrids such as Agawam, Massasoit, and Herbert, rank high. The culture of the grape is so simple that nothing need be said about it here.

Of the blackberries, Eldorado is one of the most desirable. It is high in quality and reasonably free from Orange Rust.

Plum Farmer is perhaps the best black raspberry for the home planting. I think Herbert is the best red raspberry. It is high in quality and more productive than the Cuthbert.

There are so many fine fruits that it seems strange that anyone would want currants and gooseberries, though of course the fruit can be grown with little care. Among the currants, Perfection is of the highest quality of any that I have had experience with, possessing very little of the characteristic pungent flavor of currants. If one likes the very sour Gooseberries, he would of course choose Downing; but if he likes the fruit ripe, Columbus would be a more desirable variety. This is a hybrid between the American and the European Gooseberry. The plants require much better care than American Gooseberries, but the fruit is much larger, more beautiful and of higher quality. It is of a rich golden color. The Poorman, a very beautiful red variety, also a hybrid between the American and European Gooseberries, is said to be fine for the home planting.



Vegetable Cash Crops for All Conditions

BY PAUL WORK

Superintendent of Vegetable
Gardening
at Cornell University



MUCH has been said of diversified agriculture, usually meaning a farm plan in which animal husbandry, farm crops, fruit growing or vegetable culture are combined. Few realize the wide variety in types of farming, in conditions and in crops that are included under the term Vegetable Gardening. This is readily understood when one realizes that there are over forty vegetable crops of commercial importance, that they are grown for market in every state and under every climate and that the products are available on our markets at every season of the year. They are grown both outdoors and under glass, in frames and in cellars. They are preserved by storage and by canning. They are shipped in bulk, in packages of many types and even put up as individual specimens.

Commercial vegetable production falls naturally into three great categories—truck farming, market gardening and vegetable forcing. The first two comprise the outdoor operations and are separated on the basis of their relation to market. The market gardener is engaged primarily in supplying a local trade, while the trucker is distant from the consumer and must use the common carriers. Certain general distinctions may be drawn as indicating typical characteristics of each group, but these

distinctions are by no means rigid and there are many exceptions.

The market gardener chooses his location with reference to his market. He must be near a center of population that will consume the products of his farm. Up to five years ago most market gardeners were within ten miles of the center of some city or town and a very large proportion were much nearer. Some Long Island and Jersey gardeners drive their teams as far as twenty miles, or even further. The development of the motor truck has extended the zone available for these operations. Buffalo producers drive thirty miles or more. Many gardeners are employing lands of very high value and accordingly must allow for heavy interest charges. The area involved is usually small. Distinction must be drawn between purely agricultural value and real estate or city value. Some gardeners have become wealthy through the latter rather than through crop production.

Market garden operations are intensive. Land is utilized to the utmost and every square yard is made to bear as many plants as possible. This is accomplished by close spacing, by companion cropping, and by following each crop closely by others. Thus a given area may be vacant not more than ten

days in a whole year, a hardy crop such as spinach occupying the winter season.

There is little place for horse implements on the market garden, most of the cultivation is accomplished by means of wheel and hand tools. Thus the labor requirement is heavy. As many as four or five men are employed on an area of ten acres. The high wages paid by manufacturers have made this burden especially heavy within the past few years.

Such intensive planting demands optimum growing conditions. Overhead irrigation is now employed on hundreds of acres to insure speedy maturity, heavy yields and high quality. Fertility is maintained chiefly by the use of stable manure from the city. Though the time necessary for growing green crops is begrudged, the increasing scarcity of manure is turning the thought of gardeners in this direction.

The planting scheme of the market garden is made up almost wholly of market crops in wide variety. The grower usually serves retail stores and he aims to supply the entire need of his clientele as far as possible. Specialization is not in evidence and the energy of the gardener is divided among a wide diversity of crop interests. The market garden operations are fairly continuous throughout the

year, hence he is able to employ a part of his labor constantly and he enjoys a steady income. His investment works all the while and he maintains his hold upon his trade by continuous service.

The term truck farming refers to the production of vegetable crops for transportation to distant markets. The location or rather the crops to be grown in a particular location are chosen according to adaptation and the choice of many markets is available. The land is not ordinarily of exceptional value, though neighborhood success has in some cases resulted in high realty prices. The area operated may be large. The crops are grown during the most favorable months and the land may be idle or may be planted to cover crops the rest of the year. The season of operation is summer in the north and winter in the south. Spacing is wider than in the intensive garden and intercropping is infrequent. Horse tools are employed at every turn and hand labor is reduced to a minimum. Irrigation is practiced in some cases but in general moisture is controlled by conservation. While stable manure is eagerly sought, it is not available in sufficient quantity at reasonable price and the fertility of the soil is largely maintained by the use of green crops and commercial fertilizers.

Truck growing varies from a highly



Muckland Celery Nearing Maturity



The Intensive Grower Trains His Tomato Plants

specialized type of agriculture on farms where practically the whole energy is devoted to vegetables to the production of a single cash crop as a part of a scheme of general farming. The truck farms of eastern Virginia and the muck lands of New York represent the former extreme while the planting of a few acres of late cabbage on the dairy farms of central New York illustrates the latter. The help problem is especially serious, because the farm is usually far from the centers of labor and it is difficult to arrange for year-around employment. However, the opportunities for special adaptation of crops to conditions, for the economy of large scale operations and for focused attention upon a narrow range of highly specialized activities, represent distinct advantages.

The market gardener deals face to face with his trade; he knows his men and his market problem is relatively simple. Not so with the truck farmer. He must come in contact with the complicated machinery of transportation, storage and middlemen. He may sell to a local buyer and give the matter so little thought that he does not know what is a fair price. Sometimes whole communities receive ten to twenty-five per cent less than others under similar

conditions. The market gardener may choose his dealer with real insight and insist upon good service. He may use his ability in salesmanship and build up a fancy trade among grocers or hotels, and so reap returns through business acumen as well as through skillful crop production. In any case high quality, large quantities, correct grading and packing, together with the type of business enterprise which one finds in other fields of production will enable him to realize satisfactory returns.

Truck farming is ordinarily thought of as an industry of the south. The Atlantic and Gulf Coast ship hundreds of cars of many crops every winter and spring. California is now a great truck state. There are many crops which demand a cool climate and which must be grown in northerly districts for our city markets. First among those to be widely developed as farm cash crops were potatoes and cabbage. More recently, onions, celery, lettuce, cauliflower, peas, cucumbers and even tomatoes have been added to the list. Today the arrows that might represent truck shipments on a map of the United States point in all directions and few states lack at least one or two well developed producing centers. An interesting development is typified by the production of garden

peas for New York market on dairy farms in Central New York.

Vegetable food is now available in practically complete variety throughout the calendar year. Prominent among the factors that have made this possible must be mentioned the canning industry. The production of crops for this purpose falls within the scope of truck farming, though it is usually carried on in connection with other types of agriculture and the methods are not at all intensive. Prices paid are low but so are the costs, and where a fair contract is to be had, and management is good the returns enhance the total profit from the farm. In this connection, as with other less intensive vegetable crops, the utilization of refuse as feed, the influence of the crop on the soil and its adaptability for a place in the farm rotation must all be considered.

The most highly specialized of the various forms of truck farming is the production in our northern glaciated area of muck land crops. To this may well be applied the term truck gardening for its methods are intensive. The soil consists of the residue of partially decayed vegetable matter, which has accumulated in glacial lakes and ponds. When this is only slightly decomposed, it is coarse and fibrous—of little value

for tillage. When further decayed, it becomes a soil of great friability and great water holding capacity. Though it contains much nitrogen, this is in unavailable form and commercial fertilizers are used in heavy amounts. Land values vary up to high figures in areas that are especially suitable for vegetable crops and where conspicuous success has been achieved. Holdings are usually small, some gardeners deriving a good living from five acres. The cultural methods resemble those of the market garden. Rows are close together and wheel hoes and hand tools are widely used. The drainage problem is often difficult and demands special ditching with occasionally long canals for outlet. Such cool season crops as onions, celery and lettuce are the leaders, while spinach and roots do well.

As markets have developed, the practice of growing vegetables in the young orchard has greatly increased. Such of the less intensive crops are selected as do not interfere with the development of the trees and as fit in with orchard management. In many cases these crops have paid the cost of bringing the orchard to bearing and their culture has resulted in better care for the trees as well. This practice has been common



Beans Form an Important Crop of Western New York

in New Jersey for years but is now widely prevalent in New York.

The most intensive form of vegetable production is vegetable forcing which is

greater risk and greater cost, and it demands the best a gardener can command in skill and ingenuity and painstaking care. While the capital involved



A Crop of Lettuce on Irrigated Land

conducted chiefly under glass. It includes the use of frames as practiced about New York City and in New England where a single gardener may use from two to five thousand sash. It also includes greenhouse gardening as practiced by market gardeners almost everywhere and as highly developed at Boston, Rochester, Ashtabula and other points. Vegetable forcing fits well with garden operations because it gives facilities for growing plants for early outdoor setting, it permits of profitable use of labor during the winter, enables the grower to meet his winter expenses from current receipts, and it enables him to keep in close touch with his trade throughout the year. At the same time it is the most difficult type of agriculture, for the gardener assumes control of a larger number of growth factors. He accepts responsibility not only for planting, tillage and fertilization, but also for watering, temperature and ventilation. This complete control involves

is heavy and the interest cost high, an increasing acreage is being covered with glass.

The commercial and home production of vegetables have developed to so great an extent that two side lines have attained prominence. Many gardeners, both for market and private use, prefer to buy their early plants. On Young's Island on the coast of South Carolina, cabbage plants are grown outdoors for shipments by carloads all over the south. Where tomatoes are grown for canning, the plants are produced under glass by millions for whole neighborhoods. Every community demands hundreds of plants for its home gardens during the spring months. This business demands the highest skill in garden practice. Along with forcing, it is one of the difficult lines of endeavor that appeals especially to the ambitious gardener—to the one who seeks new worlds to conquer.

The second side line is seed production. Crop growers are learning that it



A TYPICAL MARKET WAGON

Thus the market gardener delivers while the trucker must ship

pays to offer good prices for seed that is really superior. Such seed is produced at the cost of careful selection based on a thorough understanding of the laws of heredity. One New York market gardener has developed strains of tomato seed that have attained a national reputation and the prices which he asks are by no means low.

Thus it is clear that vegetable gardening offers opportunities for the man who would specialize deeply or for the man who would amend his farm plan by the addition of a single crop that may be profitably grown in harmony with his present practices. There are crops for all soils, all climates and all conditions.

EVENSONG

The embers of the day are red
Beyond the murky hill.
The kitchen smokes: the bed
In the darkling house is spread:
The great sky darkens overhead,
And the great woods are shrill.
So far have I been lead,
Lord, by Thy will:
So far have I followed, Lord, and wondered still.

The breeze from the embalmed land
Blows sudden toward the shore,
And claps my cottage door.
I hear the signal, Lord—I understand.
The night at thy command
Comes. I will eat and sleep and will not
question more.

*Robert Louis Stevenson in
Songs of Travel.*

Bringing Back the Game

BY E. A. QUARLES

Director, Department of Game Breeding and Preserving, American Game Protective Association

THOSE who have studied the question most thoroughly estimate that of the teeming millions of game of almost endless variety that was once found in this country, only 10 per cent remains. Forests have given way before the axe of the pioneer and the insistent demand of agriculture has steadily encroached upon vast areas of swamps that once characterized the country.

It is interesting to note in this connection that our agricultural schools have played their part unwittingly in the decrease of wild life through preaching the doctrine of intensive cultivation of the soil. This has rendered immense areas throughout the country practically desert land insofar as bird life is concerned, as its practice effectually does away with practically all of the food and cover that are essential to that life. It is to be hoped that our agricultural schools will soon evolve a plan of soil cultivation which, while not lessening

to any degree the production, will, at the same time, safeguard the bird life that is so valuable for the destruction of harmful insects and the seeds of noxious weeds.

Despite the wholesale destruction of game cover that has ensued in response to economic demand, the fact remains that our present scarcity of game arises in large measure from the wanton manner in which we have destroyed. Inheritors of the greatest game country the world has ever known, we have spent that heritage riotously.

When we consider the fact that the task of our forefathers in winning this country for us would have been immeasurably increased if the wild life had not afforded an abundant supply of food, our conduct seems all the more reprehensible.

Every time we plant a garden or sow a field, we upset the balance of nature, for we demand of the area thus culti-



This Method of Reproduction Does Not Keep Pace with Our Needs

vated a very much larger production than it would give under wild conditions. When this is done, the number of insects that would normally be found on such areas is very considerably increased. At the same time, but for the folly of man, there would be a proportionate increase of birds preying upon such insects, so beneficent is Nature in her workings and so finely adjusted are the laws pertaining to the maintenance of the balance of nature.

A wise people, noting the tremendous increase in the cultivation of the soil of this country, would have used every endeavor to let natural forces have full sway by protecting bird life in every way possible, but, as a matter of fact, the very opposite was the case and birds were slain by the millions to "decorate" the hats of women and to satisfy the appetite of man.

That the above statement is no exaggeration must be admitted when one considers that the United States Department of Agriculture estimates that our annual loss to crops alone from the insect pests amounts to \$1,200,000,000.

Our bird life constitutes a swiftly moving force of police which can be brought almost instantly to attack any danger point arising from the undue increase of insect life. In Utah in 1848, there was a terrible scourge of black crickets. Citizens of that state apparently faced starvation when hordes of Franklin's gulls appeared upon the scene and saved the situation. Today in the city of Salt Lake, one may see a statue erected to the gulls by the grateful citizens of Utah.

It is estimated that the unrestricted increase of one pair of gypsy moths would be numerous enough to destroy all foliage in the United States. Certain caterpillars increase 10,000 times in size in the thirty days it takes them to reach maturity. Mature man would weigh forty tons at a similar rate of increase.

Birds are not only swift in flight, but fortunately for us, they increase in size almost as quickly as the insects. Many

of the smaller species are able to fly within from three to four weeks of the time the incubation of the egg began. A man would have to eat seventy pounds of beefsteak daily to keep pace with a young robin. A pair of rose-breasted grosbeaks mentioned by Mr. E. H. Forbush in "Useful Birds and Their Protection" made 426 trips in eleven hours in feeding their young, and there were consumed during that time 848 larvae or caterpillars. Mr. Forbush estimates that a pair of scarlet tanagers can keep the insects from two average apple trees.

It has been hardly a decade since any appreciable portion of the population came to a realization of the fact that most of the game was gone and that all would go unless remedial measures were adopted. With that realization came a searching for methods designed to stop the waste and to renew the supply of game. Wiping out the supply was easy enough; creating a new one, it has been found, is quite another matter.

Many and various are the means that have been resorted to, and the failures that have been scored, as was natural, have far exceeded the successes. The law, naturally, was the resource first invoked. Two enduring measures were the result of varied efforts along this line:

1. Legislation, now adopted in nearly every state in the Union, forbidding the sale of virtually all species of wild game.

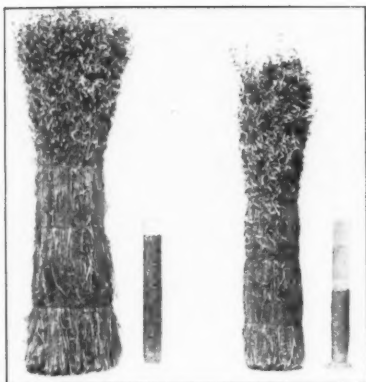
2. The Federal law, known as the Lacey Act, which forbids interstate commerce in game taken or sold in violation of the laws of the state in which the shipment originates or that to which it is consigned.

By these two the man who shoots game for the market has been all but eliminated.

In later years—on March 4, 1913, to be exact—a third and mightier legal weapon was evolved. The protection of virtually all species of migratory birds—game, song and insectivorous—has been

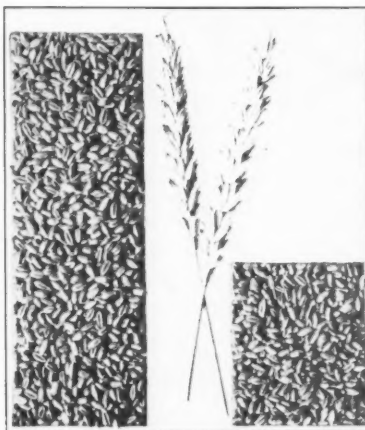
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Fertilizer Tests



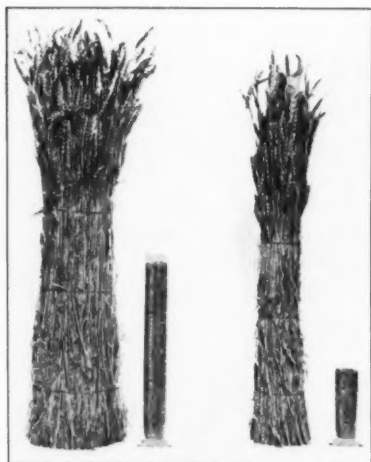
Heavy Oats and Heavier Crops with Fertilizer

The fertilizer was applied at the rate of 160 pounds to the acre. The yield of oats was 18.1 bushels to the acre, and with fertilizer it was 31.5 bushels to the acre. The fertilized oats weighed 30 pounds to the bushel and were worth 37½ cents a bushel.



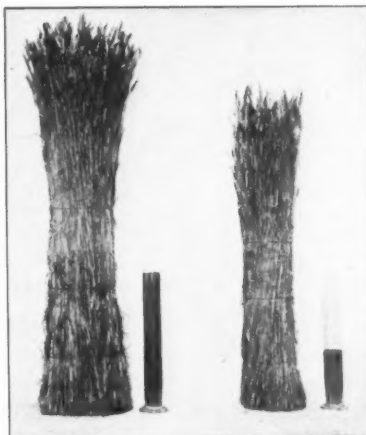
More and Plumper Grain Obtained by the Use of Fertilizer

The quantities of grain represent the exact relation of the yields on an unfertilized plot containing one acre, and a 4.5 acre plot treated with 190 lbs. of fertilizer per acre.



A Wheat-growing Experiment

In making this test 4.5 acres were fertilized and 6.7 acres were left unfertilized. The average yield of grain on the fertilized area was over twice as much as on the unfertilized. The fertilized grain weighed half a pound more to the bushel than the other.



A Study in Wheat Quality

In this case 200 pounds of fertilizer were used to the acre. The fertilized wheat weighed 58 pounds to the bushel, whereas the unfertilized weighed only 50.5 pounds to the bushel. In this particular case the application of fertilizer seemed to more than double the average yield.

THE CORNELL COUNTRYMAN

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The Cornell Countryman rejects all advertisements which are in any way objectionable or likely to prove fraudulent; and so far as it can do so, assures its readers that only reliable advertisers are represented in its pages.

Entered as second class mail matter at the post office, Ithaca, N. Y., under Act of Congress, March 3, 1879

"Meet me at the Countryman"

The *Countryman* wishes to welcome to its offices all Farmers' Week visitors. The building will be open during the whole week and we hope you will make use of it. It might so happen that your last year's subscription is not paid up. Don't let that keep you away. Come in and make the *Countryman* building your waiting room, your club room, your committee meeting room. Adopt the slogan, "Meet me at the Countryman."

What Our Fruit Growers Need

Except when conditions for fruit growing are exceptionally favorable, two-thirds of the growers make no profit at all, and half of these actually lose money. Professor Warren, head of the Farm Management Department, makes this assertion. One of the Rochester Pomology Stage speakers in urging coöperative advertising of New York State apples said, "Advertising is not a panacea for all evils but it helps solve many a problem. Under more extensive publicity over-production need not worry us for consumption and demand will increase."

When ordering oranges why are we likely to call for *Sunkist*? The answer is advertising. Why do we most usually call for Kodaks when purchasing cameras? Again the answer is advertising. Why did we have Quaker Oats or Shredded Wheat on our tables this morning? Why do we eat Heinz pickles rather than Dunlap or Markham? Surely it is not probable that one brand of pickles is so far superior to the other. No, the answer again is advertising. Now we

believe that the New York apples are better than the apples grown elsewhere. At the Panama-Pacific the New York apple received first prize and won forty or fifty honors for individuals of the state. New York State should not only be supplying her own market but should also be shipping her apples to all parts of the United States, instead of importing apples from other states for her own consumption.

But it would seem that a realization of the facts is no reason for despair. As another speaker on the Rochester Pomology Stage brought out, the fruit growers are a persevering, industrious and painstaking group of men. They are constantly contending against great odds. Insect pests and orchard diseases may be controlled but the fruit grower must face other more uncontrollable factors. A bad wind or a frosty night may make his crop a failure. Facing all these various problems and accomplishing results with hard work and at the proper time is perhaps what has made the fruit grower one of the most desirable types of American farmers. With this exceptionally strong class of farmers in her midst how much longer will the Empire State of the Union allow trains a half mile long to flood our markets while our own orchards are loaded with the best that can be grown, freezing unpicked, or rotting in piles just because of no sound coöperative advertising plan being put into practice.

Farmers' Week Reunion

The Students' Association of the College of Agriculture has arranged a business meeting and a banquet for the Wednesday of Farmers' Week, the purpose being to bring former students into reunion and into touch with the present college generation.

The business meeting will take place in Roberts Assembly on the afternoon of Wednesday, February 14. Dean Mann will address the meeting and the rest of the hour will be devoted to a discussion of strengthening the Association as a force in college affairs.

The banquet will be held at six on the evening of the same day in the Home Economics Auditorium. The Dean and others of the older men will deliver short speeches of informal tone. Those in charge of the affair hope to make it a reunion in the best sense of the word. The supper will be served cafeteria-style at Domecon prices.

The officers of the Association especially wish it known that membership therein is not limited to former students. Every Cornell Ag. man—regular, special, or winter course; past or present—is a member of the Students' Association. The business meeting and banquet are for them all. Farmers' Week affords rare privileges for our present and former students to unite. This is one of them. Past and present generations may well grasp this opportunity.

Welcome, Farmers' Week visitors!

**A Test for the
Honor System**

Too much time has been spent in talk, pro and con, on the Honor System. *The Countryman* has talked too much along this line, along with the rest. The College has about made up its mind concerning the system; no amount of debate will bring any considerable number of people to a new belief or disbelief in it. The question is no longer, "Is it good?" or "Does it work?", but "Do enough of us believe in it enough to make it work?"

It is common belief that the system, as it stands, does not work. The reason is simple. The records of our ten years trial of the Honor System show that not a single case has been reported to the Committee by a student—all have been brought up by members of the faculty. The efficiency of the system depends to a great degree upon such student supervision, and it will not work without it.

There is afoot an informal movement for the forthcoming finals by which men and women who believe in the system will initiate this supervision. In every final taken under the Honor System they will look around the room after answering each question. If they see cribbing, they will announce it and upon a repetition of the offence, they will take steps to report the offender to the Committee. They do not consider it "mean" to apprehend theft in examinations and take action upon it; they have lost the point of view of the schoolboy and gained that of community government. They seek no converts from the ranks of the dissenters, but urge that all who believe as they do shall take like action. We understand that the senior honorary societies of the College will be offered leadership in this matter; this seems fitting.

There can be no neutral stand. If a man does not believe in the system enough to accept positive as well as negative responsibility he does not believe in it all, for it has been demonstrated by experience that for the majority merely to themselves abstain from cheating is not enough. If enough students believe this deeply enough to take such a stand, the Honor System will take on a new life. Otherwise, it will probably pass to memory, but even this would seem preferable to its present passive condition.

**Consider the
Stars**

Step outdoors some clear night and consider the stars. It is good to glimpse the size of things and your place therein. And, measuring your meagre self to this scale, it will be good to find that even in the immensity of Everything you are not afraid or futile, but at home and at work.

Just a line to say that the Ag. Banquet Committee did their work well and deserve the thanks of all of us.



Campus Notes

Ag. Banquet

The seventeenth annual banquet of the College of Agriculture was held in the Home Economics Cafeteria on the evening of Saturday, January 13. Three hundred attended. The innovation of holding the affair in smaller quarters proved a decided success. Service was quicker, the speakers could be heard, and the crowd felt itself more a unit than was possible when scattered about the gymnasium, as of old.

W. D. Crim, '17, president of the association, welcomed the guests and spoke briefly on the part played by the College in University activities. In particular, he cited the case of last year's Intercollegiate meet when the Ag. men on the Cornell team alone piled up more points than the total score of any other American university.

President Schurman spoke on the growing importance of agricultural science. The present great War, he declared, has done much to establish Agriculture in its proper place in world civilization. The nation that would maintain itself must hold its agriculture as efficient and effective as its armament. He quoted an eminent Englishman to the effect that Germany would have been conquered within a year had not its agricultural development been the most thorough and scientific in the world.

In introducing Miss Araminta MacDonald, '17, Professor H. H. Whetzel, the toastmaster, advanced the proposi-

tion that "The great work of women in the world has always been to feed man." Speaking on the subject "Why Not Agriculture?", Miss MacDonald defended those girls who are taking "straight ag." against common misunderstandings and prejudices, and gave concrete examples of women, former students of the College, who are making good on the land. It would appear that in entering this field woman is finding merely another way to feed mankind.

Miss A. B. Russell, '17, gave a piano solo, to which the crowd paid the compliment of not chattering, and Director W. J. Wright of Alfred University delivered an excellent ten-minute plea for an education to teach country people to live as well as make a living.

A. R. Mann, Acting Dean of the College, was the last speaker. He told of the good which would accrue to the undergraduate could he but enter into his work with the same individual scholastic enthusiasm with which a graduate student attacks his problem, and he urged that this attitude be cultivated and carried to the world without, where it is needed.

Everyone who attended the banquet contributed something to its success. For one thing, everybody sang—not only *Alma Mater* and the *Evening Song*, but *Honey, Honey, Bless My Soul, Sweet Evaline*, and other such classics, between bites. And everybody contributed something to the spirit of the occasion, which was good.

R. L., '18.

Game Club Organized On the afternoon of January fifth, fifteen undergraduates met in the Poultry Building with Professor J. G. Needham of the Department of Entomology and members from the departments of poultry husbandry, zoology and forestry and the Cornell Game Club was organized. O. C. Krum, '17, was elected temporary president and chairman of the executive committee which is to take charge of the work of preparing the exhibit planned for Farmers' Week.

This exhibit is to be held in the laboratory of the Entomology Department on the third floor of Roberts Hall. It is the purpose of the club to make it such that it will appeal not only to the farmers of the state but to the city visitors as well. The chief appeal of the conservation movement which now includes the handling of all forms of plant and animal life useful to man, will be to the love of nature in some and to the instinct of the hunter and sportsman in others. The exhibit as planned will include mounted and live specimens of wild birds, fishes and animals. Fur-bearing animals indigenous to New York State will be shown. There will be models of houses, shelters, coops, vermin traps and other appliances used in the propagation of game birds. Together with a miniature fish pond, it is probable that there will be glass tanks containing fish eggs in the process of hatching.

On Saturday, January 13, the club took its first field trip when accompanied by Professor A. A. Allen, they tramped the west shore of Lake Cayuga and studied wild ducks. More trips of a similar nature are planned and the meetings will be given over largely to discussions of subjects observed. Those in charge of the club say that it owes its inspiration to the series of lectures on the breeding of wild game delivered here during December by E. A. Quarles under the auspices of the American Game Protective Association.

Surprise Send-off for Doctor Bailey On the evening of Friday, January 12, a party of more than two hundred faculty members of the College of Agriculture and their wives dropped in on Former Dean Bailey in his home on State Street to wish him luck and happiness on his forthcoming journey to the Orient, a journey that will take him away from Ithaca for at least nine months.

Those who planned the affair took elaborate measures to keep their plans a secret from Doctor Bailey, and they succeeded. The first intimation that he had of anything unusual was two hundred people singing *Alma Mater* on his front lawn. He invited them in and the first part of the evening was passed socially. Later Acting Dean Mann presented him with a scroll, signed by the members of the party, and which read as follows:

January 12, 1917.

To Liberty Hyde Bailey:

Greeting:

We who were your colleagues in the New York State College of Agriculture, and who are still, we trust, your colleagues in the great work of education, on the eve of your departure for the Orient desire to bid you God-speed and wish you a profitable voyage and a safe return.

We are glad that we have had your guidance, and that we still may have your counsel. We would have you know our faith in the ideals you set before us in the development of this institution—a faith that grows as the years run on. We desire to express again our gratitude for the great work you did while with us. The inspiration of your leadership is an unfading memory. We extend our best wishes for the success of the work you now have in hand.

Our hearts go with you and your family. A happy voyage, and a welcome back again.

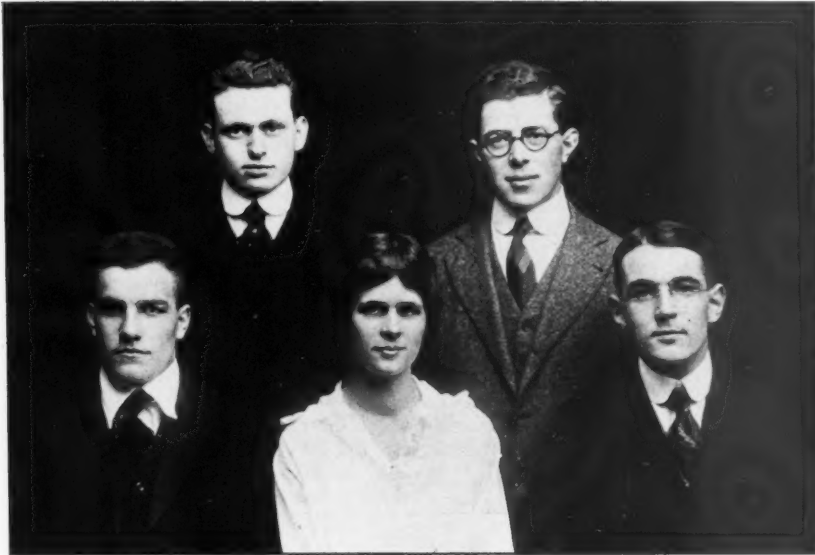
Ag. Appropriation for 1917-18

Governor Whitman in his annual budget for the fiscal year from July 1, 1917 to June 13, 1918 has proposed an appropriation which will allow nearly all the items asked by the state colleges at

Ithaca. He recommends an appropriation of \$100,000 for completion of James Law Hall, the main building of the Veterinary College, \$20,000 of which he proposes be included in this year's bill. If the appropriation bill passes, the College of Agriculture will

money will be used to equip the offices and class rooms, purchase new gun racks and seats for the galleries.

The factor which had great bearing upon the attitude of the governor toward appropriations for agricultural education is the joint report on foods



THE ROCHESTER STAGE

F. P. Cullinan
J. T. Owens (Winner)

C. B. Loudenslager (Second)
Marion Hess

D. S. Dilts

These students were selected from forty aspirants in "tryouts" held previous to the Christmas vacation, and spoke competitively before the New York State Fruit Growers' Association, convened in Rochester during the first week of January. The winner elected to take a medal instead of the optional cash prize. C. B. Loudenslager, who was second, spoke on "Advertising the Apple."

receive \$720,946, a considerable increase over last year's appropriation of \$518,325.66. The appropriation for personal service this year is \$518,531, an increase of \$129,464 over last year's figures.

The proposed budget also contains the sum of \$32,200 for the erection of a piggery, additions to the heating plant and distribution system, sidewalks and other small improvements. The tentative appropriation for the new drill hall amounts to \$24,410. Most of this

and markets which was the result of the work of the Governor's Market Commission, Mayor Michell's food supply committee in New York City and the Wicks legislative committee of which Senator M. S. Halliday, '06, is a member. Portions of the report read as follows:

"The state should lose no time in extending the work already under way at its various agricultural colleges. Other countries are far ahead of us in this respect. For instance, during the last five years the little country of Norway,

with a cattle population of 1,100,000 expended \$650,000 for a new veterinary college and equipment; while New York State, with a cattle population of 2,500,000, has expended less than \$400,000 on its veterinary college and equipment during the last twenty years. * * *

"The value of the live stock of this state, as shown by the United States census of 1910, was \$246,000,000, with an annual loss from disease of about \$25,000,000. With a veterinary service developed to the degree of efficiency that has been attained in European countries this loss could undoubtedly be reduced at least fifty per cent. * * *

Livestock Decreases

"In 1915 the United States Department of Agriculture gave the total value of New York State livestock as \$236,000,000, a decrease of nearly \$10,000,000 in five years. The only way to correct this situation is through practical educational methods and state bureaus that will ascertain the most modern methods in vogue in other parts of the world.

"Now that the western lands of our country have nearly all been taken up, we believe the time is ripe for this state to render all the aid it possibly can and offer all the inducement it possibly can to people who will engage in farming on either a small nor large scale in this state. We believe that no better investment could be made on behalf of the people than appropriations by the Legislature along these lines. Good roads are all-important; canals are all-important; but the most important thing that could be hauled over these good roads and on these canals is produce from the farms."

A very practical course in pomology has been given to the short course student this term. The course included a study of soils, plant diseases, insect enemies as well as fruit growing itself. The soils work considered the handling of fruit soils, draining, fertilizing, tilling and cultivating. While the student was given instruction as to the best practices in fruit growing in New York State, stress was also laid upon conditions which will affect the whole country. Professor Ralph W. Rees who has taken charge of this course has had experience in the fruit growing industry on the Pacific coast and in New York and New England.

The New York State College of Agriculture has decided to conform with the new standard of tuition fees established by the University and in September, 1917, all students taking agriculture at Cornell and not residing in this state will be required to pay \$150, an increase of \$25 over the fee now charged.

Professors Bristow Adams, R. S. Hosmer, and S. N. Spring left Ithaca on January 15 to attend a meeting of the New York State Foresters' Association held in New York City on January 16 and 17. Upon the conclusion of this meeting the three professors left for Washington, D. C., where they attended the International Foresters' Conference held January 18 and 19 under the auspices of the American Forestry Association.

Major Hersey, formerly in charge of the Weather Bureau at this university and later in similar position at Milwaukee, has accepted a position in the extension work of the bureau and has been stationed in the West Indies, where a large part of his duties will consist in reporting hurricane conditions.

On January 19 the Agassiz Club met to consider "The Inheritance of a Bud Variation in Maize."

The "Use Policy" which the Government has inaugurated for its national forests, the importance of forests in our national life and the need of their protection were points especially emphasized by Professor Bristow Adams in illustrated lecture, delivered in Roberts Assembly on the evening of January 11.

At the annual meeting of the New York State Breeders' Association held at Syracuse on January 8, 9 and 10 Professor H. H. Wing spoke on the subject "New York State as a Dairy State" (Continued on page 402)

FORMER STUDENT NOTES



Morgan

'89, B. S.—G. Howard Davison graduated from the Sheffield Scientific School at Yale University in 1888 with the degree of Ph. B. He entered Cornell University in the fall 1888 as a senior and graduated in agriculture the following June. Subsequently he took a course in the American Veterinary College and received the degree of D. V. S. Shortly after graduation Mr. Davison purchased a farm in the historic part of Dutchess County and actively engaged in agriculture and matters pertaining thereto. He established and successfully bred a herd of Guernsey cattle and owned the famous bull—Lord Stranford, whose descendents are still making records for themselves in lines of production. He was more notably successful as breeder and exhibitor of Shropshire sheep and his flocks have maintained a permanent



G. Howard Davison, '89

place in state and national exhibits. On one occasion, he successfully exhibited an American-bred flock of Shropshires at the English Royal Show in the native

home of this breed.

Mr. Davison has taken part in most of the larger agricultural associations in this country. He was Secretary of the New York State Agricultural Society when that organization had the management of the State Fair. He has been a member of the Board of Control of the Geneva Experiment Station, President of the International Livestock Exposition at Chicago and a member of its Executive Committee since it was organized. His present activities are largely in con-

nection with the publication of "The Field" and as Chairman of the Executive Committee of the National Agricultural Society.

H. H. W.

'11, W. C.—Ransford Ray Gould, formerly of Jamestown went west in 1912 and is now engaged as private secretary to R. R. Wise, of Brainard, Minnesota, putting in part of his time on Mr. Wise's three thousand acre ranch. Just to prove that he is thoroughly acclimated, Mr. Gould has a word to say for the climate and rapid growth of the city of Brainard and, just to show that he has not forgotten the east, he sends his best wishes to *The Countryman*, the College and all Cornellians.

'12, B. S.—Harry Embleton is New York Manager of the Sharples Cream Separator Company.

'12, B. S.—Anna E. Hunn is at Cornell in charge of the Home Economics Cafeteria and Instructor in Institutional Management. She is residing at 923 N. Tioga St.

'12, B. S.—Wallace Henry Hook taught high school in Maryland for two years after graduating. In 1913 he married Miss Faith Kimball of Franklin County, N. Y. He is now entering upon his third year of work as Farm Bureau Manager of Ulster County, Mrs. Hook acting as his assistant and taking charge of all the office work.

'12, W. C.—Leland G. Robison is farming near New Lisbon.

'13, B. S.—We are in receipt of the following note from Miss Margaret L. Robinson:

"For three years the *Countryman* has been coming to me and I have enjoyed it greatly and am enclosing check for three dollars. It brings more of the Cornell spirit and especially College of Agriculture spirit than anything except a visit to Ithaca could."

Miss Robinson is now Supervisor of Domestic Arts at Winchester, Mass.

'13, B. S.—Dora Louise Earl is Instructor in Home Economics at Madison.

'13, B. S.—A note of extraordinary interest comes from Dorothea E. Kielland, telling of work in teaching agriculture and out-of-door sciences in the

Inanda Mission Station, (Private Bag), Durban, South Africa. She has been in Africa since September, 1915, and is now teaching industrial work, sewing, cooking, laundry work, gardening, and Christianity in the Inanda Seminary for Zulu girls. The girls have separate school gardens in which they raise the common American vegetables and flowers. Besides this, they help with the flowers, vegetables, and poultry about the school. Some of the fruits raised are bananas, paw paws, mangos, guavas, peaches, apples, mulberries, and grapes. Among those Americans doing work in that part of the world, Miss Kielland mentions the following Cornellians:

Jacobus C. Faure, B. S., '12, is government entomologist in Bloemfontein, Orange Free State, Africa.

Jan Neethling, M. S. A., '12, is Lecturer in Botany at the Elsenburg School of Agriculture, near Cape Town, South Africa. He is doing experimental work on the breeding of wheat.

'14, M. S. A.—A. C. Hottes is Assistant Professor of Floriculture in the Department of Horticulture of Ohio State University, Columbus, Ohio. New and extensive greenhouses have lately been added to the department equipment and, as Ohio is one of the states leading in the value of flower products, his friends are congratulating him upon his broad opportunities.

'14, B. S.—Laura Fish Mordoff was married in August, 1914, and since then has been living at Forest Home.

'14, B. S.—Louis Dicker has moved from Warwick to Dixville Notch, New Hampshire, where he is engaged in work on Farm Number One of the Balsams Stock Farms.

'14, B. S.—C. L. Slocum is Manager of the Commissary Department of the Aetna Explosive Company, Hamilton, Pennsylvania.

'14, Sp.—E. J. Pyper has general supervision of a farm near Chazy. He is doing special work in plant diseases, seed selection, and germination testing.

(Continued on page 400)

THE NEW DE LAVAL

A Bigger and Better Cream Separator for the Same Money



THE FARMER who buys a De Laval this year will get bigger and better value for his money than ever before.

Not only will he get a better machine, a simpler machine, a machine that will skim even closer than any previous De Laval, but he will get a machine of larger capacity.

And the price has not been increased one cent.

Just think what that means to cow owners in the face of rising prices on almost everything else the farmer has to buy, including other cream separators.

Only the tremendous volume of De Laval sales makes it possible to give the farmer more for his money when others are giving less.

The NEW De Laval is the culmination of nearly forty years of experience and development by the largest and oldest cream separator concern in the world.

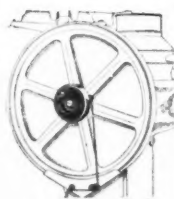
Important Features of the NEW DE LAVAL

Greater Capacity

Without increasing the size or weight of the new bowl, its capacity has been increased.

Self-Centering Bowl

The bowl is loosely supported upon the spindle and will run true and do perfect work even after long wear.



Skims Closer

The improved bowl design, together with the patented milk distributor, gives greater skimming efficiency.

Discs Interchangeable

All discs are exactly alike, are unnumbered, and are interchangeable.

Fewer Discs

There are fewer discs in the new bowl, although the capacity is greater.

Easier to Wash

Simpler bowl construction and fewer discs, caulked only on the upper side, make the bowl easier to wash.

Easier to Turn

The low speed of the De Laval bowl, large capacity for the size and weight of the bowl, automatic oiling and high grade workmanship, make the De Laval the easiest cream separator to turn.

Every New De Laval is now equipped with a Bell Speed-Indicator, the "Warning Signal" which insures proper speed and uniform cream.

New Catalog will be mailed upon request

THE DE LAVAL SEPARATOR CO.

165 Broadway, New York

29 East Madison Street, Chicago

50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER

Where you saw it will help you, them and us

Former Student Notes

(Continued from page 398)

'14, B. S.—M. F. Abell is now Assistant in Farm Crops in the local department. Upon graduation he went to Ohio State University and assisted in the farm crops department there. He is doing graduate work at Cornell in addition to the duties of his position.

'14, W. C.—Leon Curtis may be addressed at Stanley. He was married last winter and shortly afterward purchased a farm of sixty acres in the town of Gorham, Ontario County. He reports his main crops as cabbages, beans and apples.

'14—Mr. and Mrs. Hale A. Mixer announce the marriage of their daughter, Ruth Elwood Mixer, to Samuel Stockton Burdge, '14. Mr. and Mrs. Burdge are residing at Grand View Hill Farm, Dayton, Ohio.

'14, B. S.—E. T. Chase is Farm Bureau Agent for Passaic County, New Jersey. He is specializing in problems of raising vegetables and marketing them to New York City.

'14, B. S.—Edwin G. Bishop is a partner in the Mechanical Refrigeration Company, Chemical Building, St. Louis, Mo.

'14, W. C.—W. C. Cash passed through Ithaca recently on his way to Cincinnati, where he will assume charge of the Rathburn-Croft Poultry Farms, a tract of 140 acres. While poultry products are the specialty, about twenty head of livestock are maintained upon the farm. Since his graduation, Cash has been employed as a poultryman on the large Belmont Farms at Perrysburg, Ohio. His trip was in the nature of a honeymoon, since on Thanksgiving Day he was married to Miss Mary Fisher of Owensville, Missouri.

'14, W. C.—William Conklin claims that after taking two short courses here at Cornell, he decided that

the home farm was not a paying proposition. His address is now Box 171, Chester.

'14, B. S.—Having purchased the home farm at De Ruyter a year ago, R. J. Wilcox is attempting to build up a herd of pure bred Holsteins. Besides dairying, he raises some potatoes and cabbage for cash crops.

'14, B. S.—Louis B. Hendershot has returned to Cornell and is taking graduate work for the purpose of obtaining an advanced degree. He has been connected with the biology department of the West High School in Rochester during the past two years and intends to return in 1917.

'14, B. S.—DeForest W. Ludwig was married to Miss Irene Collins of Meyersdale, Pa., on October 12. Their home will be in Pittsburgh.

'15, W. C.—Dean R. Peet put in the year after leaving College in a cheese factory at New Lisbon. He is now on a dairy and poultry farm near Morris. The farm supports a herd of forty dairy cows, eleven of which are pure-breds, and he hopes in time to have a herd one hundred per cent pure.

'15, W. C.—H. C. Snow is working on a fruit and dairy farm near Red Creek.

'15, M. S. A.—Merrick V. Barnes may be addressed at Bethlehem, Pa., where he is teaching agriculture.

'15, B. S.—James B. Clark, who has been at Barcelonita, Porto Rico, has changed his address to Central Romana, La Romana, Dominican Republic.

'15, B. S.—The address of Frederick A. Davis, Jr., is No. 8 Europa Building, Obispo Street, Havana, Cuba. He is with Arthur Leutchford of Havana as a landscape architect. They are designing the grounds of the sugar "centrals" throughout the island of Cuba.

'15, Ph. D.—George A. Osner is associate botanist at the Indiana Experi-

(Continued on page 406)



Potato Seed Scarce?

Make Every Piece Count

Seed potatoes will be far more carefully cut and handled this spring than usual. Every piece is a "veritable nugget of gold". Then make it do its full share toward producing a bumper crop; use the

IRON AGE 100 % Potato Planter

Puts a seed piece in every hill and **never** puts two pieces in the **same** hill. Saves about 20 bushels of seed on a 10 acre field and increases the stand 10% or more—no misses.

The "Iron Age" plants by machine—the boy on the rear seat merely makes corrections. And these corrections mean a net saving of from \$5 to \$50 an acre. Seed pieces are placed at uniform depth and spaced evenly insuring maximum yield. Plants in a straight line—easy to cultivate, spray and dig. Sows fertilizer at same time but fertilizer is thoroughly mixed with the soil and cannot come in contact with the seed. Handles small and medium seed, whole or large seed when cut.

We make a full line of Potato, Cultivating and Spraying machinery. Every "Ag" man should have a copy of our free booklet, "100 % Potato Planting". Write today.

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Visitors always wel-
come. Catalogue
FREE — ask for it.

**RICE BROTHERS
COMPANY**

GENEVA

NEW YORK

Packing Apples in Boxes

(Continued from page 369)

When the box pack is finished the fruit should not stand more than $\frac{1}{8}$ of an inch above the end of the box, but in the middle the fruit should be from $\frac{3}{4}$ to $1\frac{1}{4}$ inches above the sides, figure 6. When nailed this will give a bulge on both top and bottom of $\frac{1}{4}$ to $\frac{3}{8}$ of an inch. When packing apples on end, bulge may be secured by using those which are of the same diameter but slightly more elongate in the middle of each layer and flat ones at the ends of the layer. If making the cheek packs, use apples of very slightly greater diameter in the middle of the layers.

If the beginner will pay special attention to the proper spacing of the first half dozen apples in each layer, and be careful about using only fruit which is uniform in size, he will have no trouble in making layers come out right at the end of the box. While packing the first few boxes take plenty of time to see that each layer is properly done. It may seem to be a slow process, but speed will be quickly developed with practice.

Campus Notes

(Continued from page 396)

and the Importance of Pure Bred Animals to the Dairy Interests of the State" and Professor K. J. Seulke, also of the Department of Animal Husbandry, spoke on the subject "Swine Husbandry in Relation to New York State Farmers."

The Plant Breeding Department conducted a demonstration before the Cornell Chapter of Sigma Xi in the plant breeding laboratory on the evening of January 15. The main topic of the exhibit was the recent improvements and advances which have been made in the study of heredity. The meeting was open to the public as well as the members.

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Join the country-wide money-making movement, "A Silo on Every Farm." Add 40% to the value of your corn crop; cut down your feed bills; and increase your milk and beef sales. Erect a Natco. The stock will eat every scrap of silage and look for more.

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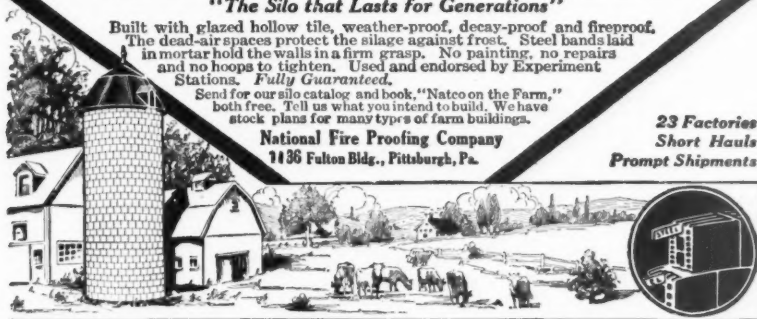
Built with glazed hollow tile, weather-proof, decay-proof and fireproof. The dead-air spaces protect the silage against frost. Steel bands laid in mortar hold the walls in a firm grasp. No painting, no repairs and no hoops to tighten. Used and endorsed by Experiment Stations. *Fully Guaranteed.*

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23 Factories
Short Hauls
Prompt Shipments



Quality Sprays Give Results

Green Cross Dry Powder Arsenate of Lead

FRUIT KIL-TONE

Rushville, N. Y., Jan. 1, 1917.

"Gentlemen:—I want to send you a few lines in regard to our experience with Kil-Tone. We had always used the old bordeaux mixture and never thought there was anything as good, but the sulphate of copper being scarce and price so high, we decided to try some of the Kil-Tone; we did hate to change for we thought there was nothing like the bordeaux mixture.

"We used the Kil-Tone on our apples, potatoes and grapes and found far greater results than we had ever expected, especially on the grapes. There were some that we didn't spray at all, and they mildewed, rotted the wood and didn't ripen, and the grapes were hardly worth harvesting, and in the same vineyard where we put on one application of Kil-Tone, they were perfectly free from rot and mildew."

(Signed) BUTTON BROTHERS,

W. H. B.

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THE KIL-TONE COMPANY

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Chicks---Little Chicks--- Chicks

The time has arrived for all persons interested in Poultry, to make plans for their Baby Chick Campaign—

SEASON of 1917

The demand for day-old Chicks will be enormous, greater than ever before. We are manufacturers of **Eaton's Life-Saver Little Chick Feed**, and handle a full line of Baby Chick requirements—would be pleased to quote.

Address

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SWIFT'S LAYMORE Meat Scraps

Make hens lay in winter when Eggs are scarce and high in price. Made from Fresh Meat Residues from U. S. Inspected Animals they are the cheapest, cleanest, handiest Meat Feed on the market. Used by all Best Poultrymen. Endorsed by all State Experiment Stations. If you are not feeding them you are losing money. For free sample and prices address

Swift & Company
Harrison Station NEWARK, N. J.

The Work of the Weather Men (Continued from page 376)

cent expansion of the system of snow-fall observations throughout the mountain regions adjacent to the Great Plains, it has been made possible to forecast the probable flow in the rivers of the arid regions, a factor of great importance in irrigation. The records of the Bureau are of frequent use as evidence in courts of law, for which purpose they have been decided competent evidence by the Supreme Court of the United States.

The conduct of the regular stations of observations outside of Washington requires the constant services of about six hundred, and the business of the Central Office at Washington of about two hundred employees. The annual disbursements of the Bureau amount to about \$1,600,000.

The numerous offices of the Bureau throughout the country are always open during business hours and the public are cordially invited to visit them and avail themselves of the information contained in the records there on file.

Campus Notes (Continued from page 396)

Forty students who are taking the course in Meat and Meat Products in the Department of Animal Husbandry attended an inspection trip to Buffalo. The trip, which started January 14 and ended January 17, included visits to the stock yards and the principal packing houses, canning factories and tanneries. The early morning sale of incoming cattle was witnessed and informal talks were given to the students by commission men.

The Department of Poultry reports an unusual demand for managers and assistant managers of poultry farms and chick hatcheries. The demand being largely for work to begin in the spring will be especially available to
(Continued on page 410)

A. H. Heberle Nurseries

*Founder
of the
Rochester
Peach*



One Year Rochester Peach

Plant Rochester Peach for Profit

It is large, yellow with a red cheek; flesh yellow, sweet, rich, luscious. Ripens Aug. 15th or same time as Carman. The tree is very hardy, vigorous and extremely productive, it has no equal as a canning peach, and will ship as well as Elberta. The original orchard has borne its 7th annual crop, some specimens measuring 12 inches in circumference, this orchard has not missed a crop since it was 2 years old. 40 bushels shipped out of Rochester last Summer sold for \$2.15 net, and was sold on Rochester Market for 75c to \$1.00 per 11 qt. baskets, when Carman was selling for 30 to 40c.

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NURSERIES and ORCHARDS

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All Classes of Farmers

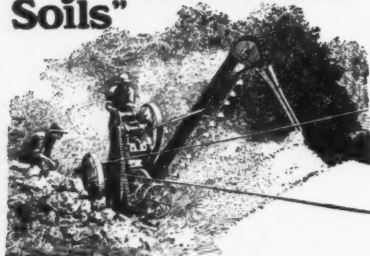


use PLOWS some. Why not insist on the lightest draft and most satisfactory make. The **LE ROY** made by a strictly New York State independent Company.

Our Catalogue?

LE ROY PLOW CO.
Le Roy, N. Y.

"Best and Cheapest way to doctor sour Soils"



F. P. Maxwell, of Buckhannon, W. Va., writes: "There is no trouble to grind 3 tons per hour. I had about 900 tons ground last year and do not notice any wear on the grinder. I think it is the best and cheapest way to get lime to doctor sour lands. It did not cost me more than 50 cts per ton to get our rock and pulverize same." If you have limerock on your farm it will pay you just as it has paid Mr. Maxwell—saving you from \$1.50 to \$2.50 per ton.

The Jeffrey **LIME PULVER**

Grinds limestone to any fineness—handles rock weighing 60 lbs. or more. Built in sizes to suit engines from 8 h.p. to 30 h. p., with outputs of from 1 to 7 tons per hour. Saves you from \$1.50 to \$2.50 on every ton—no hauling—no freight to pay. Every machine guaranteed. Write for information about new sizes and FREE trial offer. (27)

THE JEFFREY MFG. CO.

289 First Avenue

Columbus, Ohio

Former Student Notes (Continued from page 400)

ment Station, Lafayette, Indiana. During the past summer he has been in northern Indiana, working on cucumber diseases in coöperation with the Department of Agriculture.

'15, B. S.—Walter H. Scheffield, a graduate of the Department of Landscape Art, is at present employed by Charles W. Leavitt on the estate of Charles M. Schwab. His address is Loretto, Pa.

'15, B. S.—T. B. Charles, formerly instructor in the poultry department is temporarily in the real estate business with headquarters at Elmira. His work takes him to several states. It is concerned with the development of suburban sections near growing cities.

'16, W. C.—A. G. Martan is working on a dairy farm at Winthu, Delaware.

'16, B. S.—Berton E. Ely is teaching in the State School of Agriculture at Farmingdale, Long Island.

'16, B. S.—Benjamin Brickman is assistant seedsman on the farm of E. Maule & Co. His address is Route 2, Box 65, West Grove, Pa.

'16, B. S.—Miles W. Bryant is with Bryant's Nurseries, Princeton, Ill.

'16, B. S.—Announcement has been made of the engagement of Miss Abigail R. Burton, daughter of Mrs. Frances A. Burton and the late Rev. Henry R. Burton, of Suplee, Pa., to Gilbert M. Montgomery, '16. Montgomery has bought the White Oak Farm of 138 acres at Glen Moore, Chester County, Pa.

'16, B. S.—E. E. Ludwig's address is 710 East Diamond Street, Pittsburgh, Pa. He is in business with his father in the E. C. Ludwig Floral Co.

'16, B. S.—Gertrude H. Nelson's address is changed from Willseyville, N.

(Continued on page 408)

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Bordeaux Lead Arsenate

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Bordeaux Mixture

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2 More Quarts Of Milk From Each Cow

Hundreds of dairymen report a gain of two quarts of milk per day from each cow because they use International Special Dairy Feed. Figure out what this would mean from your herd. And remember that International Special Dairy Feed costs less to feed than home-grown grains. There is not a single month of the year when

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cannot be fed with profit. It is an ideal all-year-'round ready grain ration. Milk Means Money. More milk means more money for you. And the surest way of getting the most milk at the lowest cost is to feed your herd International Special Dairy Feed. Some of the country's foremost dairymen have proved this to be a fact.

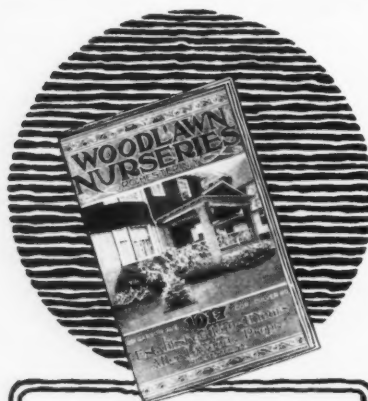
Go to Your Dealer. Try one ton—the result will be so good you will never again be without International Special Dairy Feed. Be sure you get International.

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Where you saw it will help you, them and us



You'll Find This Book

a reliable guide of fruits and ornamentals. It tells what to plant in your locality, and how to trim and spray. Describes a wide variety of apples, peaches, pears, cherries and small fruits. Also full of helpful suggestions for beautifying your grounds. Just write a postal for a free copy.

Woodlawn Nurseries, Allen L. Wood, Prop.
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Chick raising IS NOT a matter of luck

So many chicks die early that most poultry raisers think healthy chicks just a matter of luck. But it's largely a matter of feed.

Don't feed little chicks raw grain.

To raise the largest per cent of your next brood, try

H-O Steam-Cooked Chick Feed

It is made from carefully selected grains, including Cut Oatmeal, and it is steam-cooked—so that the little chick can assimilate all the nourishment that it contains.

Write for sample, prices
and descriptive folder.

THE H-O COMPANY
MILLS
BUFFALO, N. Y.

JOHN J. CAMPBELL
GEN. SALES AGENT
HARTFORD, CONN.

Former Student Notes

(Continued from page 406)

Y., to 101 South Manning Boulevard, Albany, N. Y.

'16, B. S.—H. C. Handleman is running his father's general truck farm at Caldwell, N. J.

'16, B. S.—Fred Horton is now employed as herdsman at Silver Lake Farm, Silver Lake, Penn. There are at present 26 head of pure bred Holsteins on the farm. The owner's intention is to build up a larger and better herd.

'16, B. S.—N. C. Rogers is teaching horticulture and agricultural chemistry at Schoharie State School of Agriculture, Cobleskill, N. Y.

'16, W. D. C.—Conrad Shumway is dairyman on the Clark estate at Cooperstown, N. Y.

'16, B. S.—Helen Van Kuren is assisting Miss Pettit in home economics extension work for the Erie County Farm Bureau.

'16, Ph. D.—J. L. Weimar is now an assistant in the botany department of the Indiana Experiment Station at Lafayette, Ind.

'16, B. S.—Gertrude M. Button is teaching in the Department of Household Arts and doing considerable extension work for the Harrisburg State Normal School at Harrisonburg, Va.

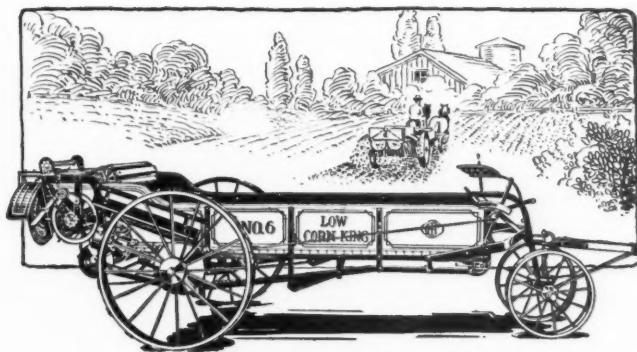
'16, B. S.—Ruth Cleaves has charge of the table at the University Club on the campus.

'16, Ph. D.—C. C. Chupp is substitute professor of botany at Wabash College, Crawfordsville, Ind., in the absence of Professor H. W. Anderson.

'16, B. S.—Helen Irish is assisting Miss Little in the management of the dining rooms at Sage College.

(Continued on page 410)

In writing to advertisers please mention The Cornell Countryman



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The man who uses a **Low Cloverleaf, Low Corn King or Low 20th Century spreader** these days is taking advantage of the newest efficiency in spreader building. His land increases in value and his crops grow better in quality and larger in yield because of all the spreaders on the market, these come nearest to working as spreaders should work.

It is a long jump from the ordinary machine to the modern

low spreader with its double beater and wide spread. Every farmer who knows the value of good spreading is buying one of these wide spread machines. As a matter of fact, no farmer can afford to buy any other kind, because the saving of time and labor and the better job of spreading done by a **Low Cloverleaf, Low Corn King or Low 20th Century** makes them worth more than ordinary spreaders.

Complete information about these machines is worth money to you. Drop us a line at the address below and we will show you very plainly the advantages to be found in **LOW CLOVERLEAF, LOW CORN KING** and **LOW 20th CENTURY** Spreaders. You will find this interesting.

INTERNATIONAL HARVESTER COMPANY of AMERICA
CHICAGO (Incorporated) U.S.A.

Where you saw it will help you, them and us

Clean Up!

Turn bush-land into cornfield, disk your roadsides and kill the chinchbugs. The

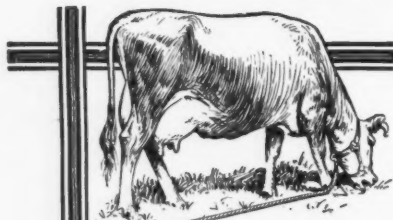
Cutaway

CLARK

Bush and Bog Plow

does away with the bushknife, grubhoe and shovel—it's better, quicker and cheaper. The *forged* sharp Cutaway disks penetrate deep, cutting roots, turf and trash and pulverizing the soil. Splendid for deep tillage. 2 horse and 4 horse. Reversible. If your dealer has not the *genuine* Cutaway write to us direct. Be sure to write us for our new book, "The Soil and Its Tillage." Get your copy *now*.

THE CUTAWAY HARROW COMPANY
Maker of the original
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Breed and Brand

When you buy cows you choose a certain registered breed;—because you know what to expect from that breed;—because you know you'll surely get full value for your money,—and absolute satisfaction.

When you buy Rope and Binder Twine select the best "breed",—those with the best reputation. Be sure you get

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because they, too, represent money's worth and absolute satisfaction. They are better, because expert workmen,—men who know how,—make Columbian Rope and Twine,—and they make it carefully,—from the best quality fibre,—the kind that's tough and strong.

Put Columbian Rope on your hay fork,—and Columbian Binder Twine in your twine can. It costs no more than others,—and saves time and money in the end.

Send for our story—"The Adventures of a Bale of Hemp,"—and a set of our colored post cards.

COLUMBIAN ROPE CO.

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Branches:—New York—Chicago—Boston

Former Student Notes

(Continued from page 408)

'16, B. S., W. C.—John T. Kentfield is in charge of a creamery at Jacksonville, N. Y.

'16, W. D. C.—Maurice Mereness has a position with the Hilcrest Farms, Binghamton, N. Y.

'16, B. S.—Lois Osborne is secretary of the Cornell branch of the Y. W. C. A.

'16, Ph. D.—L. M. Massey is engaged in extensive rose investigations which are being conducted in coöperation with the American Rose Society. He addressed the Ontario Horticultural Association on "Diseases of Roses" at their convention in Toronto on November 22.

'16, B. S.—Gertrude Bates has entered the nurses' training class of the Clifton Springs Sanitarium at Clifton Springs.

'16, B. S.—George H. Boettner is teaching agriculture and science at Orange, Tex.

Campus Notes

(Continued from page 404)

men in the winter course who finish their work here on February 16.

Dr. Liberty Hyde Bailey, former dean of the College of Agriculture, will leave for the Orient the latter part of this month. Dr. Bailey will be away for about nine months and during this time will travel in China, Japan, the Philippines, Hawaii, and the East Indies, where he expects to devote considerable time to horticultural research. The Ithaca Board of Commerce, of which Dr. Bailey is vice-president, is arranging to give a dinner in his honor before his departure to the Pacific coast.

R. A. Mordoff leaves February 15 for Harvard University, where he will pursue graduate work for the coming term.

Barter's Announcing
**Tested "Garden and
 Seeds Lawn" 1917 Edition**

Write for a copy of this beautiful seed catalogue and handbook on gardening. It contains many directions on cultivation, etc., and is profusely illustrated in color.

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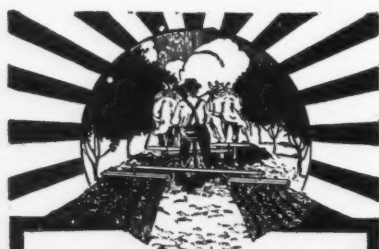
Woven with a mechanically hinged joint. Big, full gauge wires—full weight—full length rolls. Superior quality galvanizing—proof against hardest weather conditions.

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Fancy Fruit

grows only in well-tilled orchards. Intensive orchard tillage pays. Work in close to the trees with an

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Cuts, crushes, mulches, levels, and compacts the soil—all in one operation. Keeps the orchard clean as a new pin. Extension and regular styles—a size to suit you. Our new free book, *The "Acme" Way to Crops That Pay*, is ready. Send today for your copy.

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DWARF FRUIT TREES



Fine for the Home Garden; they need less room. Bear Quicker, and give finest fruit. My choice stock of dwarf fruit trees will please you.

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WITH THE ADVERTISERS

THE SILO QUESTION

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A New Arrival in Jersey Royalty

A twenty-five thousand dollar son is the latest offering that the Jersey cow Sophie 19th of Hood Farm, the world's champion, long-distance butter cow of all breeds has made to the dairy world. Sophie, for whom her owner, Mr. C. I. Hood of Lowell, Mass., refused an offer of \$50,000, is truly the dam of the golden calf, for her son now weighs about ninety pounds which in gold would be worth \$25,920, and Mr. Hood refused to consider a \$25,000 offer for the calf. Sophie has a record of over two and three-quarter tons of butter in six years, which is the greatest ever made by a cow of any breed.

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**No Matter What Breed of Cows You Have, Sucrene Dairy Feed
Will Increase Their Milk Yield at a Considerable Decrease In Feed Cost.**

You do not have to buy costly protein concentrates to go with Sucrene Dairy Feed—unless you want to force the yield to the extreme.

Sucrene Dairy Feed

Carries sufficient protein, fat and carbohydrates to produce a *steady, permanent increase*, and maintain the cow in vigorous, healthy condition.

Strongly Endorsed by State and U. S. Government Authorities

Robt. H. Ruffner, Asst. Professor of Animal Husbandry, Maryland Agricultural College, writes:

"Sucrene Dairy Feed gave perfect satisfaction, and from the result of the trial I gave it while in the employment of the Isthmian Canal Commission, I recommend that it be ordered in car load lots for the dairy at the Ancona Hospital."

The Molasses in Sucrene Dairy Feed makes it palatable, also aids digestion and promotes the general health of the cow. It is stronger in digestible carbohydrates than any other known feed.

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carrying 25% protein, 8% fat, 30% carbohydrates. This feed forces cows to their extreme milk producing capacity when fed only with the usual roughage.

Let us send you records of test feeds by big dairymen who are enthusiastic about our Dairy Feeds.

Cheaper than your grain ration. Ready to Feed. Always uniform in quality.

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Box 1212

Little Falls, N. Y.

Bringing Back the Game

(Continued from page 388)

placed in the hands of the Federal Government, substituting one authority for the conflicting regulations heretofore prescribed by the forty-eight states. That law was placed on the statute books in a campaign led by the sportsmen, working through their national organization, the American Game Protective Association.

Many of our most valuable and interesting song, insectivorous and game birds breed in Canada and spend only part of the year with us. This fact led to the successful negotiation of a treaty during the past summer, whereby birds that migrate between this country and Canada will be given adequate protection.

In the above I have endeavored to outline briefly the principal legal measures taken for the protection of our wild life. Another and valuable source of protection for wild life lies in the large number of local, state and national organizations of men and women interested in such work. The two principal national organizations are the National Association of Audubon Societies, whose work lies largely among the song and insectivorous birds, and the American Game Protective Association, whose endeavors are addressed in large measure to the game species, though both organizations hold themselves ready at all times to aid the conservation of wild life in every way possible. In addition to laws and organizations, there are other principal measures for the protection of wild life that have been evolved, and two of them, at least, should be considered here.

The first of these measures and, in the opinion of many of those most competent to judge, the most important of them all, consists of a movement to establish in the various communities of the country refuges for wild life where it will always be inviolate and where

(Continued on page 416)

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Bringing Back the Game

(Continued from page 414)

seed stock can always breed unmolested by man. This is known as the "Community Sanctuary Movement." It originated, so far as I can ascertain, in California and has made more or less progress since then in Oregon, Washington, Iowa, Michigan, Pennsylvania, Ohio, Utah, Massachusetts, Missouri and Illinois. Iowa and Pennsylvania seem to be cultivating the movement most assiduously, and it is in these states, probably, that we shall learn most of its merits and shortcomings.

In an address delivered at the first national conference on game breeding and preserving, held under the auspices of the American Game Protective Association, Chief Warden E. C. Hinshaw of Iowa stated that more than 300,000 acres had been set aside in his state for sanctuary purposes, that vermin was being trapped on these by the game wardens and that food-bearing shrubs, vines, trees and grains were being planted. In addition, these areas of refuge have been stocked with quail, ringnecked pheasants and Hungarian partridges.

Pennsylvania, under the leadership of Dr. Charles B. Penrose and John M. Phillips, is doing splendid sanctuary work. A systematic war has been fought against vermin. A single strand of wire surrounds the Pennsylvania sanctuaries, and woe betide the man who trespasses upon them with dog and gun.

In Washington there is a game commission for each county and these have authority to declare sanctuaries of such areas as they see fit. In King County in the course of last year, for instance, seven tracts, averaging 1000 acres each, were thus designated and ringnecked pheasants, reared on a game farm maintained by the county, were placed on them. This winter other tracts will be set aside as sanctuaries and next fall

(Continued on page 418)

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Bringing Back the Game

(Continued from page 416)

shooting will be allowed on the seven tracts first set aside. Thus in rotation will areas be set aside, stocked and shot on alternate years. This is a variant of the community sanctuary idea and an interesting one.

Back of the sanctuary idea is the knowledge that game cannot survive on covers to which the general shooting public has admittance, for each gunner will kill to the last individual, arguing that if he does not get the game some one else will. Crops cannot be grown without seed, and, viewed from this standpoint, game is as much a crop as wheat. The sanctuary, then, furnishes the acreage in which the game crop seed can be sown. It means continuing sport for the man who cannot afford a private preserve or a club by furnishing an overflow of game from its boundaries for sporting purposes.

A page has been taken from the science of horticulture, also, in the development of measures to bring back the game. As the gardener uses a hot bed to hasten and increase production, so with several species of game it has been found that breeding in captivity will produce progeny largely in excess of that occurring in the wild state. Of the upland game bird the ringnecked pheasant has proved most adaptable to breeding in captivity, and the following states are turning out these birds yearly by the thousand on the game farms they have established: Massachusetts, Connecticut, New York, New Jersey, Louisiana, Kentucky, Iowa, Washington, Oregon and California. Michigan has just authorized a state game farm, and Tennessee also contemplates establishing one. New York has achieved such good results with its first farm that it now has three in operation, with a fourth authorized.

(This article is the first of a series of four. The second will appear in March.)

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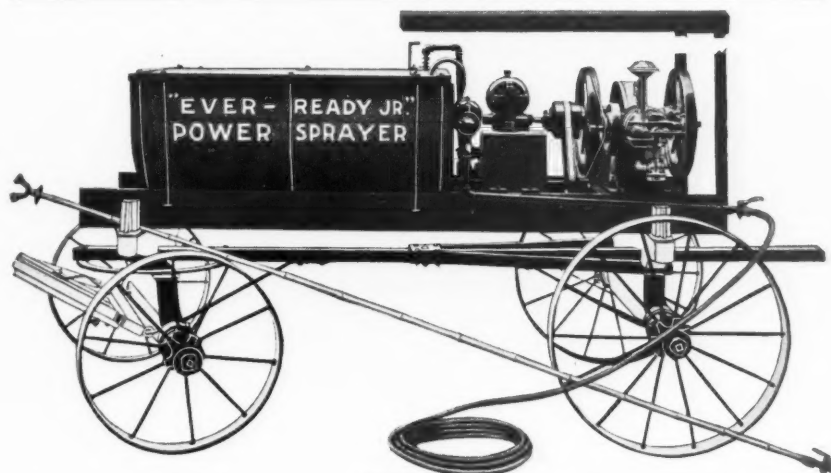
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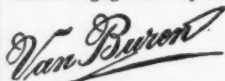
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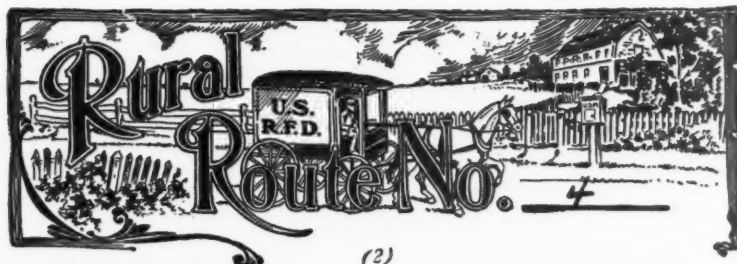
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(2)

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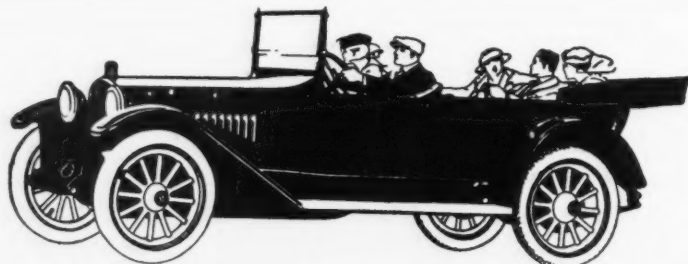
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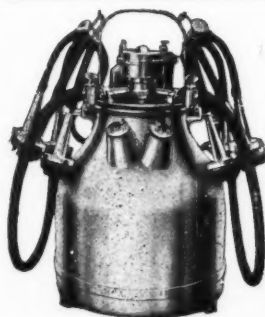
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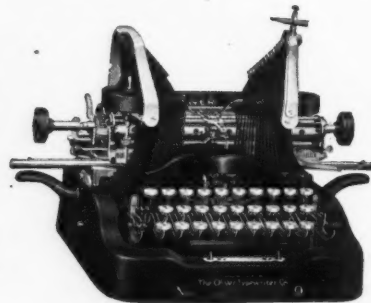
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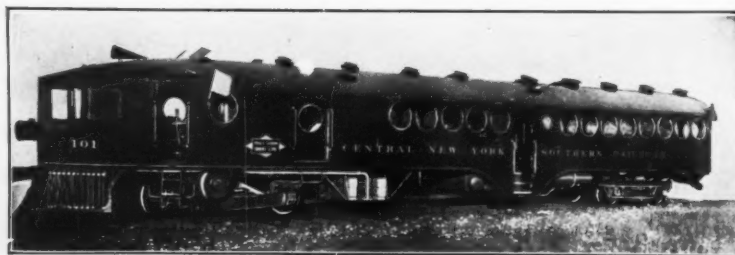
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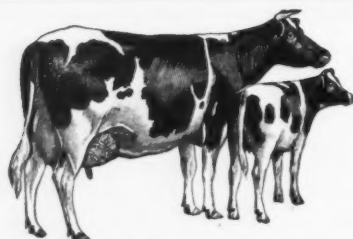
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Milk 30 days	2826.2

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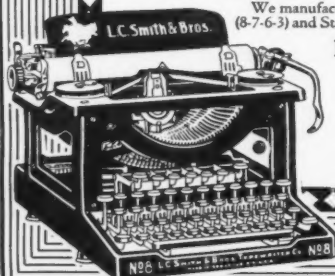
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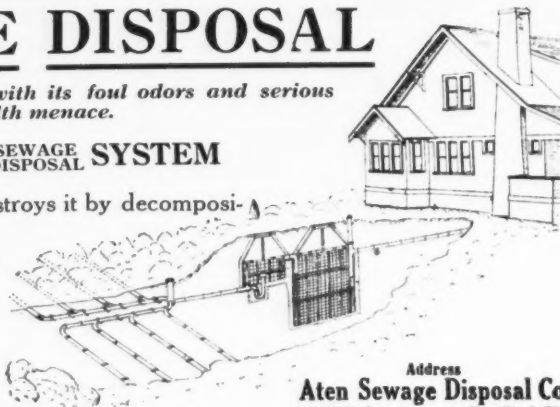


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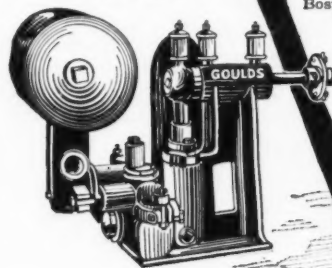
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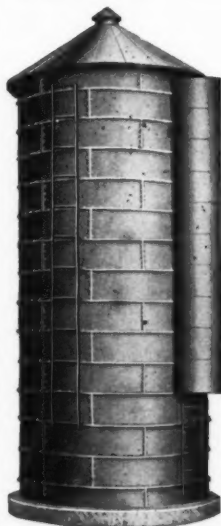
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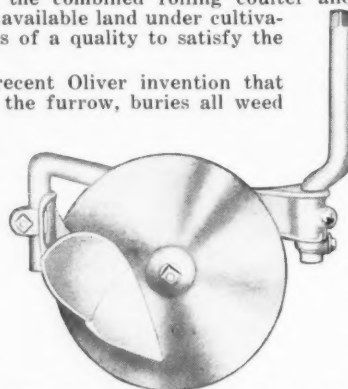
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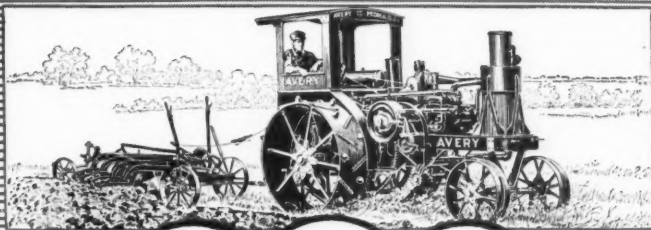
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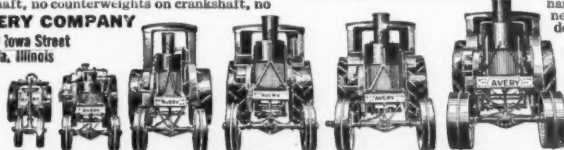
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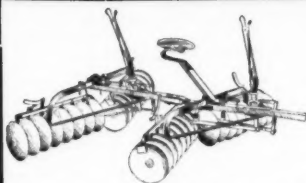
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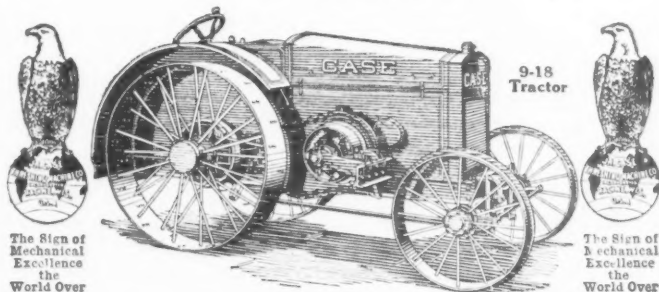
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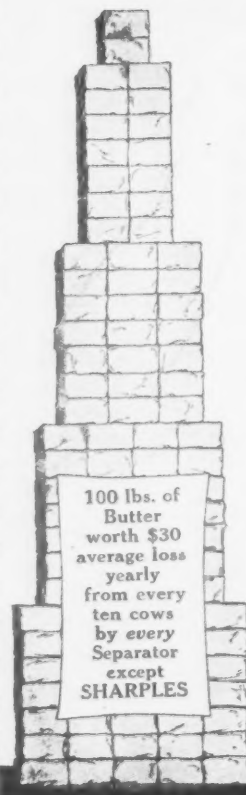
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